

M. med.

271^h

Elliot

Fig. 7.



Royce sc.

Fig. 5.



Fig. 6.



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Magellan, & M^r. Parker:

further improved by M^r. Blades.

A N
A C C O U N T
O F T H E
NATURE AND MEDICINAL VIRTUES
O F T H E
Principal Mineral Waters
O F
GREAT BRITAIN AND IRELAND,
A N D T H O S E
MOST IN REPUTE ON THE CONTINENT.

TO WHICH ARE PREFIXED,

Directions for IMPREGNATING WATER with FIXED AIR,
in order to communicate to it the peculiar Virtues of
PYRMONT WATER, and other MINERAL WATERS
of a similar Nature. Extracted from Dr. PRIESTLEY'S
EXPERIMENTS ON AIR.

WITH AN APPENDIX,

Containing a Description of Dr. NOOTH'S Apparatus, with the
IMPROVEMENTS made in it by others. And a Method of
IMPREGNATING WATER with SULPHUREOUS AIR, so as to
imitate the AIX-LA-CHAPELLE and other SULPHUREOUS
WATERS.

By JOHN ELLIOT, M.D.

L O N D O N:

PRINTED FOR J. JOHNSON, N^o. 72, ST. PAUL'S
CHURCH-YARD, MDCCLXXXI.

Bayrische
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A T T E N T I O N
OF THE
MAYORS AND MEDICAL VIRTUES
OF THE
Principal Medical Writers
OF
GREAT BRITAIN AND IRELAND,
AND THE
MOST INFLUENTIAL OF THE CONTINENT.

Directions for the use of Water with Extracts of
in order to be made use of in the treatment of
Pneumonia, Pleurisy, and other Inflammatory Affections
of a kindred nature. Extracted from Dr. Ross's
Experiments on Air.

WITH AN APPENDIX
Containing a Description of Dr. Ross's Apparatus, with the
Improvements made in it by others. And a Method of
Immersing the Water with sulphurous Air, as is
done in the Spa at Cheltenham, and other Sulphureous
Waters.

By JOHN FLEMING, M.D.
L O N D O N:
PRINTED FOR J. JOHNSON, No. 72, ST. PAUL'S
CHURCH-YARD, M.DCCCLXXII.

Bayerische
Staatsbibliothek
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ADVERTISEMENT.

Dr. PRIESTLEY's Pamphlet on the Impregnation of Water with Fixed Air being out of print, and that Gentleman having no intention of republishing it, I have judged proper to prefix it to the following Tract, with the additions as printed in his second Volume of Experiments on Air. This was done as well that the reader might be entertained with the history of this discovery, as instructed in an easy method of making the impregnation when Dr. Nooth's apparatus might not be at hand.

Newman Street, Aug. 30, 1781.

J. E.

N. B. In the introduction to the alphabetical list of mineral waters, those of Bath, Matlock, and Chaude-Fontaine, are, after the example of preceding writers, set down among the sulphureous waters; but they ought rather to be classed with the waters impregnated with fixed air. The term *calcareous Glauber's salt*, is also used in one or two places, from the same authors, though it is not strictly proper; modern chemistry having discovered that the basis of that salt is not *calcareous earth*, but *magnesia*.

ADVERTISEMENT.

Dr. Priestley's *Pamphlet on the Impregnation of Water with Fixed Air* being out of print, and that Gentleman having no intention of republishing it, I have judged proper to prefix it to the following *Tracts*, with the additions as printed in his second Volume of *Experiments on Air*. This was done as well that the reader might be entertained with the history of this discovery, as instructed in an early method of making the impregnation when Dr. Wootch's apparatus might not be at hand.

ERRATA.

Page 76, line 6 and 7, dele *Bath* and *Matlock*.

79. l. 13, dele *calcareous Glauber's*.

Errata of less consequence the reader will easily correct,

O F T H E
I M P R E G N A T I O N O F W A T E R
W I T H
F I X E D A I R.

C H A P T E R I.

The History of the Discovery.

I T often amuses me when I review the history of experimental philosophy, to observe how very nearly one discovery is connected with another, and yet that, for a long time, no person shall have perceived that connection, so as to have been actually led from the one to the other; and especially that he who made the first discovery should stop short in his progress, and not advance a single step farther, to make the other, which was perhaps of infinitely more consequence. And yet the case may be such, that it shall be so far from requiring more genius, or ingenuity, to advance that other step, that it is rather a matter of wonder, how it was possible for the most com-

mon capacity to stop short of it. We also frequently find that they who make the most important philosophical discoveries overlook the most obvious *uses* of them. Several striking examples of this kind will be found in my *History of electricity*, and also in the *History of discoveries relating to vision, light, and colours*.

In such cases as these it behoves an historian to be much on his guard, lest he should hastily conclude that to have been fact which he only *imagines* must have been so, but for which no direct evidence can be produced. As this is a case of some curiosity respecting the human mind, I shall give an instance of it; and I am able to produce a very remarkable one relating to the subject of this section.

When it was discovered that the acidulous taste and peculiar virtues of Pyrmont water, and other mineral waters of a similar nature, were owing to the fixed air which they contained; when this air had been actually expelled from the water, and it was found that the same water, and even other water, would
reim-

reimbibe the same air; we are apt to conclude that the person who made these discoveries, and especially the last of them (who also must have known that fixed air is a thing very easy to be procured) must have immediately gone to work to reduce this *theory* into *practice*, by actually impregnating common water with fixed air, in order to give it the peculiar virtues of those medicinal mineral waters which are so highly, and so justly valued, and which are procured at so great an expence, especially in this country. Accordingly, Dr. Nooth has advanced, Phil. Trans. vol. 65, p. 59, that “the possibility of
“impregnating water with fixed air was no
“sooner ascertained by experiment, than
“various methods were contrived to effect
“the impregnation;” and I doubt not this ingenious philosopher imposed upon himself in the manner described above. This, however, is so far from being the case, that I do not believe it is possible to produce the least evidence that any person had the thing in view before the publication of my pamphlet upon that subject, in the year 1772.

4 *Of the Impregnation of Water*

Indeed had this thing been so much as *an object of attention* to philosophers, it is impossible but that some of them must have hit upon a method that would have sufficiently succeeded. Nay, the thing is so very easy, and the end attainable in so many ways, that there must have been, in a very short time, a great variety of methods to impregnate water with fixed air, as there are now; and we should certainly have heard of *artificial mineral waters* being made according to them. It is impossible not to conclude so, when we consider the *time that has elapsed* since the publication of all the discoveries that led to it.

Dr. Brownrigg's paper, giving an account of his discovery of fixed air in the Spa water, was read at the Royal Society June the 13th 1765, and was published in 1766. This excellent philosopher compleatly decomposed that mineral water, but he gives no hint of his having so much as attempted to *recompose* it, or of making a similar water, by impregnating common water with the same volatile principle. It is sufficiently evident that he had not thought of this, though we may wonder

wonder that he should not have done it, because he has not mentioned it, as an object of pursuit.

In the year following, Mr. Cavendish's valuable papers on the subject of factitious air were published. He first ascertained how much fixed air a given quantity of water could be made to imbibe; yet it does not appear that he ever thought of *tasting* the water, much less that he thought of making any *practical use* of his discovery.

If any negative argument can be decisive, it is that in 1772, the very year in which my pamphlet came out, Dr. Falconer published his excellent and elaborate treatise on the *Bath waters*, in which he treats very largely of mineral waters in general, and all their possible impregnations; and yet, though he treats of *fixed air* as one ingredient in many of them, see p. 185, he drops no hint about composing such water, by imparting fixed air to common water. Also on the 12th of September in the same year, Dr. Rutherford published his ingenious *Dissertation on Fixed Air*, in which he speaks of the

presence of it in Pyrmont water, p. 3, but without giving the least hint of his being acquainted with any method of imitating them. And yet Dr. Nooth says, in fact, that from the year 1766, at the latest, *various methods* were contrived to effect the impregnation, though he allows that I was the only person who “published any description of an apparatus calculated entirely for this purpose.”

According to this account of the matter there were, in the interval between 1766 and 1772, a space of six years, a variety of methods for impregnating water with fixed air, some of them prior to, and perhaps much better than mine (though he gives no hint of his own having been invented in that period, but speaks of it as suggested by the consideration of the imperfection of mine) but that I happened to get the start in the publication. Dr. Falconer, however, though the friend of Dr. Nooth (see his treatise on Bath Water, vol. 2. p. 323) had certainly never heard of any of those methods, or even of mine, at the very termination of that period; and though my own acquaintance

tance with philosophical and medical people is pretty extensive, I never heard of any of the *various methods* that Dr. Nooth speaks of; nor since the publication of my method have I heard of any person whatever having pretended to have done the same thing before; though nothing is more common than such claims, and very often on the most trifling pretences.

Mr. Venelle, indeed, immediately upon the translation of my pamphlet into French, which was within a few weeks after the publication of it in English (owing to the laudable zeal of Mr. Trudaine, for promoting all philosophical and useful improvements) published an extract of his papers from the *Memoires de Mathematique & de Physique*, to vindicate to himself not my discovery, but, in fact, that of Dr. Brownrigg. However, what he pretends to have discovered was, that the virtues of the acidulous waters were owing to *air, in general*, without having any idea of the difference between fixed air and common air; so that his discovery was so far from being the same with mine, that it could not possibly have led into it.

As I have hitherto only published the method of impregnating water with fixed air in a small pamphlet, for the use of those who might chuse to reduce it into practice, without giving any account of the manner in which the discovery (if it deserves to be called one) was made, which has been my custom with respect to every thing else, I shall do it here; and I hope the narrative will not be altogether displeasing, as this business has gained so much attention in all parts of Europe, as well as in England, and promises in a short time to save the very great expence of transporting acidulous waters to considerable distances, by superfeeding, in a great measure, the use of them. And though what I have done in this business has certainly the least merit possible with respect to *ingenuity*, I shall always consider it as one of the *happiest* thoughts that ever occurred to me; because it has proved to be of very signal *benefit* to mankind, and will, I doubt not, be of much more consequence in a course of time.

It was a little after Midsummer in 1767, that I removed from Warrington to Leeds; and

and living, for the first year, in a house that was contiguous to a large common brewery, so good an opportunity produced in me an inclination to make some experiments on the fixed air that was constantly produced in it. Had it not been for this circumstance, I should, probably, never have attended to the subject of air at all. Happening to have read Dr. Brownrigg's excellent paper on the Spa water about the same time, one of the first things that I did in this brewery was to place shallow vessels of water within the region of fixed air, on the surface of the fermenting vessels; and having left them all night, I generally found, the next morning, that the water had acquired a very sensible and pleasant impregnation; and it was with peculiar satisfaction that I first drank of this water, which I believe was the first of its kind that had ever been tasted by man.

This process, however, was very slow. But after some time it occurred to me, that the impregnation might be accelerated, by pouring the water from one vessel into another, while they were both held within the sphere of the fixed air; and accordingly I found

found that I could do as much in about five minutes in this way, as I had been able to do in many hours before. Several of my friends who visited me while I lived in that house will remember my taking them into that brewery, and giving them a glass of this artificial Pyrmont water, made in their presence. Among others, I will take the liberty to mention John Lee, Esq; of Lincoln's Inn, who was particularly struck with the contrivance, and the effect of it. This was in the summer of the year 1768.

One would naturally think, that having actually impregnated common water with fixed air, produced in a brewery, I should immediately have set about doing the same thing with air set loose from chalk, &c. by some of the stronger acids; and I do remember that it did occur to me that the thing was possible. But, easy as the practice proved to be, no method of doing it at that time occurred to me. I still continued to make my Pyrmont water in the manner abovementioned 'till I left that situation, which was about the end of the summer 1768; and from that time, being engaged in other similar pursuits,

pursuits, with the result of which the public are acquainted, I made no more of the Pyrmont water 'till the spring of the year 1772.

In the mean time I had acquainted all my friends with what I had done, and frequently expressed my wishes that persons who had the care of large *distilleries* (where I was told that fermentation was much stronger than in common breweries) would contrive to have vessels of water suspended within the fixed air, which they produced, with a farther contrivance for agitating the surface of the water; as I did not doubt but that, by this means, they might, with little or no expence, make great quantities of Pyrmont water; by which they might at the same time both serve the Public, and benefit themselves. For I never had the most distant thought of making any advantage of the scheme myself.

In all this time, viz. from 1767 to 1772, I never heard of any method of impregnating water with fixed air but that abovementioned. My thinking at all of reducing to practice any method of effecting this, by air dislodged from chalk, and other calcareous substances, was

was owing to a mere accident. Being at dinner with the Duke of Northumberland, in the spring of the year last mentioned, his Grace produced a bottle of water distilled by Dr. Irving for the use of the navy. This water was perfectly sweet, but, like all distilled water, wanted the briskness and spirit of fresh spring water; when it immediately occurred to me that I could easily mend that water for the use of the navy, and perhaps supply them with an easy and cheap method of preventing or curing the sea scurvy, viz. by impregnating it with fixed air. For having been busy about a year before with my experiments on air, in the course of which I had ascertained the proportional quantity of several kinds of air that given quantities of water would take up, I was at no loss for the *method* of doing it in general, viz. inverting a jar filled with water, and conveying air into it from bladders previously filled with air. This scheme I immediately mentioned to the Duke and the company, who all seemed to be much pleased with it, and expressed their wishes that I would attend to it, and endeavour to reduce it into practice; which I promised to do.

The

The next day I provided a small apparatus, adapted to this purpose, at my lodgings, which was very easy, as it required no other vessels but such as are in constant family use, and with this I presently impregnated a quantity of the New River water, so as to make it imbibe about its bulk of air. But I was far from having hit upon the *easiest method* of doing it; for my jars were of an equal width throughout. However, with these vessels the process was compleated in about twenty minutes, or half an hour.

A few days after this, having an invitation to wait upon Sir George Savile, I carried with me a bottle of my impregnated water, and told him the use that might be made of it, viz. that of supplying a pleasant and wholesome beverage for seamen, and such as might probably prevent or cure the sea-scurvy. Sir George, with that warmth with which he espouses every thing that he conceives to be for the public good, insisted upon writing a card immediately to Lord Sandwich, proposing to introduce me to him, as having a *proposal for the use of the navy*. As I could make no objection, the card was accordingly written,

ten, and an answer was presently returned from his Lordship, informing us that he would be glad to see us the next day. Upon this I drew up something in the form of a *propofal*, which, accompanied by Sir George, I presented to his Lordship, who promised to lay it before the Board of Admiralty.

Presently after this I had notice from the Secretary to the Board of Admiralty, that the *College of Physicians* were appointed to examine my propofal, and to make their report of it to the Board, and an early day was fixed for me to wait upon them at their hall in Warwick-Lane; where, before a very full meeting, I produced a bottle of my impregnated water, and also, at their request, fetched my apparatus, and shewed them the manner in which I had impregnated it. There were present several of the most eminent physicians in London; but both the *scheme*, and the *object* of it, appeared to be entirely new to every one of them; and most of them seemed to be much pleased with it.

According-

Accordingly, a favourable report was made to the Board of Admiralty, and I was acquainted by the Secretary, that the Captains of the two ships which were just then sailing for the South-Seas had orders to make a trial of the impregnated water; and for their use I drew out my *Directions* in writing, and sent a drawing of the necessary apparatus. The method which I had now got into was a great improvement upon that which I had made use of before the College of Physicians. For, in consequence of giving more attention to it, I had, by that time, brought it to the state in which it is described in the pamphlet.

In the mean time, I had, before I left London, in the spring of that year, made the experiment of the impregnation of water with fixed air in the presence of most of my philosophical acquaintance, and their friends, both at my own lodgings, and in other places. But upon none of these occasions did it appear that any of them had heard of any other person having had the same thing in view.

Lastly,

Lastly, I will observe, that Sir John Pringle, in his *Discourse on different kinds of air* (in which he has, with the greatest exactness, assigned to every person concerned in these discoveries their due share of praise) gives no hint of his being acquainted with any other method of impregnating water with fixed air, than that which I had published. He certainly had not heard of any of those to which Dr. Nooth alludes.

As I have not to this day, directly or indirectly, made the least advantage of this scheme; but, on the contrary, am just so much a loser by it as the experiments cost me, I think it is not too much for the Public to allow me, what I believe is strictly my due, *the sole merit of the discovery*; which with respect to *ingenuity*, or *sagacity*, is next to nothing; but with respect to its *utility* is, unquestionably, of unspeakable value to my country and to mankind.

CHAPTER II.

DIRECTIONS *for impregnating* WATER
with FIXED AIR.SECT. I. *The Preface to the Directions as
first published.*

The method of impregnating water with fixed air, of which a description is given in this pamphlet, I hit upon in a course of experiments; an account of which was lately communicated to the Royal Society; containing observations on several different kinds of air, with only a hint of the method of combining this particular kind with water or other fluids. Judging that water thus impregnated with fixed air must be particularly serviceable in long voyages, by preventing or curing the sea-scurvy, according to the theory of Dr. Macbride; and all the Physicians of my acquaintance concurring with me in that opinion, I made the first communication of it to the Lords of the Admiralty, who referred me to the College of Physicians; and those gentlemen being pleased to make a report favourable

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vourable to the scheme, a trial has been ordered to be made of it on board some of his Majesty's ships. To make this process more generally known, and that more frequent trials may be made by water thus medicated, at land as well as at sea, I have been induced to make the present publication.

Sir John Pringle first observed, that putrefaction was checked by fermentation; and Dr. Macbride discovered that this effect was produced by the fixed air which is generated in that process, and upon that principle recommended the use of *wort*, as supplying a quantity of this fixed air, by fermentation in the stomach, in the same manner as it is done by fresh vegetables, for which he, therefore, thought that it would be a substitute; and experience has confirmed his conjecture. Dr. Black found that lime-stone, and all calcareous substances, contain fixed air, that the presence of it makes them what is called *mild*, and that the deprivation of it renders them *caustic*; Dr. Brownrigg farther discovered that Pyrmont, and other mineral

mineral waters, which have the same acidulous taste, contain a considerable proportion of this very kind of air, and that upon this their peculiar spirit and virtues depend; and I think myself fortunate in having hit upon a very easy method of communicating this air to any kind of water, or, indeed, to almost any fluid substance. In short, by this method this great antiseptic principle may be administered in a variety of agreeable vehicles.

If this discovery (though it doth not deserve that name) be of any use to my countrymen, and to mankind at large, I shall have my reward. For this purpose I have made the communication as early as I conveniently could, since the latest improvements that I have made in the process; and I cannot help expressing my wishes, that all persons, who discover any thing that promises to be generally useful, would adopt the same method.

SECT. 2. *The Directions.*

If water be only in contact with fixed air, it will begin to imbibe it, but the mixture is greatly accelerated by agitation, which is continually bringing fresh particles of air and water into contact. All that is necessary, therefore, to make this process expeditious and effectual, is first to procure a sufficient quantity of this fixed air, and then to contrive a method by which the air and water may be strongly agitated in the same vessel, without any danger of admitting the common air to them; and this is easily done by first filling any vessel with water, and introducing the fixed air to it, while it stands inverted in another vessel of water. That every part of the process may be as intelligible as possible, even to those who have no previous knowledge of the subject, I shall describe it very minutely, subjoining several remarks and observations relating to varieties in the process, and other things of a miscellaneous nature.

The

The Preparation.

Take a glass vessel, *a*, pl. 2. fig. 1. with a pretty narrow neck, but so formed, that it will stand upright with its mouth downwards, and having filled it with water, lay a slip of clean paper, or thin pasteboard, upon it. Then, if they be pressed close together, the vessel may be turned upside down, without danger of admitting common air into it; and when it is thus inverted, it must be placed in another vessel, in the form of a bowl or basin, *b*, with a little water in it, so much as to permit the slip of paper or pasteboard to be withdrawn, and the end of the pipe *c* to be introduced.

This pipe must be flexible, and air-tight, for which purpose it is, I believe, best made of leather, sewed with a waxed thread, in the manner used by shoe-makers. Into both ends of this pipe a piece of a quill should be thrust, to keep them open, while one of them is introduced into the vessel of water, and the other into the

bladder *d*, the opposite end of which is tied round a cork, which must be perforated, the hole being kept open by a quill; and the cork must fit a phial *e*, two thirds of which should be filled with chalk just covered with water.

I have since, however, found it most convenient to use a *glass tube*, and to preserve the advantage which I had, of agitating the vessel *e*, I have *two bladders*, communicating by a perforated cork, to which they are both tied. For one bladder would hardly give room enough for that purpose.

The Process.

Things being thus prepared, and the phial containing the chalk and water being detached from the bladder, and the pipe also from the vessel of water, pour a little oil of vitriol upon the chalk and water; and having carefully pressed all the common air out of the bladder, put the cork into the bottle presently after the effervescence has begun. Also press the bladder

der

der once more after a little of the newly generated air has got into it, in order the more effectually to clear it of all the remains of the common air ; and then introduce the end of the pipe into the mouth of the vessel of water as in the drawing, and begin to agitate the chalk and water briskly. This will presently produce a considerable quantity of fixed air, which will distend the bladder ; and this being pressed, the air will force its way through the pipe, and ascend into the vessel of water, the water at the same time descending, and coming into the basin.

When about one half of the water is forced out, let the operator lay his hand upon the uppermost part of the vessel, and shake it as briskly as he can, not to throw the water out of the basin ; and in a few minutes the water will absorb the air ; and taking its place, will nearly fill the vessel as at the first. Then shake the phial containing the chalk and water again, and force more air into the vessel, 'till, upon the whole, about an equal bulk of air has been thrown into it. Also shake the water

as before, 'till no more of the air can be imbibed. As soon as this is perceived to be the case, the water is ready for use; and if it be not used immediately, should be put into a bottle as soon as possible, well corked, and cemented. It will keep, however, very well, if the bottle be only well corked, and kept with the mouth downwards.

Observations.

1. The basin may be placed inverted upon the vessel full of water, with a slip of paper between them, and then both turned upside down together; but all this trouble will be saved by having a larger vessel of water, in which both of them may be immersed.

2. If the vessel containing the water to be agitated be large, it may be most convenient first to place it inverted, in a basin full of water, and then to draw out the common air by means of a syphon, either making use of a syringe, or drawing it out with the mouth. In this case, also,
some

some kind of handle should be fastened to the bottom of the vessel, for the more easy agitation of it.

3. A narrow mouthed vessel is not necessary, but it is the most proper for the purpose, because it may be agitated with less danger of the common air getting into it.

4. The flexible pipe is not necessary, though I think it is exceedingly convenient. When it is not used, a bent tube, *a*, fig. 2. (for which glass is the most proper) must be ready to be inserted into the hole made in the cork, when the bladder containing the fixed air is separated from the phial, in which it was generated. The extremity of this tube being put under the vessel of water, and the bladder being compressed, the air will be conveyed into it, as before.

5. If the use of a bladder be objected to, though nothing can be more inoffensive, the phial containing the chalk and water must not be agitated at all, or with
the

the greatest caution ; unless a small phial, *a*, fig. 3. be interposed between the phial and the vessel of water, in the manner represented in the drawing. For by this means the chalk and water that may be thrown up the tube *b* will lodge at the bottom of the phial *a*, while nothing but the air will get into the pipe *c*, and so enter the water. If the tube *b* be made of tin or copper, the small phial *a* will not need any other support, the cork into which the extremities of both the tubes are inserted being made to fit the phial very exactly.

6. The phial *e*, fig. 1. should always be placed, or held, considerably lower than the vessel *a* ; that if any part of the mixture should be thrown up into the bladder, it may remain in the lower part of it, from which it may be easily pressed back again. This, however, is not necessary, since if it remain in the lower part of the bladder, nothing but the pure air will get into the pipe, and so into the water.

7. If much more than half of the vessel be filled with air, there will not be a body
of

of water sufficient to agitate, and the process will take up much more time.

8. If the chalk be too finely powdered, it will yield the fixed air too fast.

9. After every process, the water to which the chalk is put must be changed.

10. It will be proper to fill the bladder with water once every day, after it has been used, that any of the oil of vitriol which may have got into it, and would be in danger of corroding it, may be thoroughly diluted.

11. The vessel, which I have generally made use of, holds about three pints, and the phial containing the chalk and water is one of ten ounces; and I find that a little more than a tea-spoonful of oil of vitriol is sufficient to produce as much air as will impregnate that quantity of water.

12. If the vessel containing the water be larger, the phial containing the chalk and the oil of vitriol should either be larger in proportion, or fresh water and oil of vitriol must

must be put to the chalk, to produce the requisite quantity of air.

13. In general, the whole process does not take up more than about a quarter of an hour, the agitation not five minutes; and in nearly the same time might a vessel of water, containing two or three gallons, or indeed any quantity that a person could well shake, be impregnated with fixed air, if the phial containing the chalk and oil of vitriol, be larger in the same proportion.

14. To give the water as much air as it can receive in this way, the process may be repeated with the water thus impregnated. I generally chuse to do it two or three times, but very little will be gained by repeating it oftener; since, after some time, as much fixed air will escape from that part of the surface of the water which is exposed to the common air, as can be imbibed from within the vessel.

15. All calcareous substances contain fixed air, and any acids may be used in order to set it loose from them; but chalk and oil
of

of vitriol are, both of them, the cheapest, and, upon the whole, the best for the purpose.

16. It may possibly be imagined that part of the oil of vitriol is rendered volatile in this process, and so becomes mixed with the water; but it does not appear, by the most rigid chymical examination, that the least perceivable quantity of the acid gets into the water in this way; and if so small a quantity as a single drop of oil of vitriol be mixed with a pint of water (and a much greater quantity would be far from making it less wholesome) it might be discovered. The experiments which were made to ascertain this fact were made with *distilled water*, the disagreeable taste of which is not taken off, in any degree, by the mixture of fixed air. Otherwise, distilled water, being clogged with no foreign principle, will imbibe fixed air faster, and retain a greater quantity of it than other water. In the experiments that were made for this purpose, I was assisted by Mr. Hey, a surgeon in Leeds, who is well skilled in the methods of examining the properties of mineral waters.

17. Dr.

17. Dr. Brownrigg, who made his experiments on Pyrmont water at the spring head, never found that it contained so much as one half of an equal bulk of air; but in this method the water is easily made to imbibe an equal bulk. For it must be observed, that a considerable quantity of the most soluble part of the air is incorporated with the water, as it first ascends through it, before it occupies its place in the upper part of the vessel.

18. The heat of boiling water will expel all the fixed air, if a phial containing this impregnated water be held in it; but it will often require above half an hour to effect it compleatly.

19. If any person would chuse to make this medicated water more nearly to resemble genuine Pyrmont water, Sir John Pringle informs me, that from eight to ten drops of *Tinctura Martis cum spiritu salis* must be mixed with every pint of it. It is agreed, however, on all hands, that the peculiar virtues of Pyrmont, or any other mineral water which has the same brisk or acidulous taste,

taste, depend not upon its being a chalybeate, but upon the fixed air which it contains.

But water impregnated with fixed air does of itself dissolve iron, as the ingenious Mr. Lane has discovered; and iron filings put to this medicated water make a strong and agreeable chalybeate, similar to some other natural chalybeates, which hold the iron in solution by means of fixed air only, and not by means of any acid; and these chalybeates, I am informed, are generally the most agreeable to the stomach.

20. By this process may fixed air be given to wine, beer, and almost any liquor whatever: and when beer is become flat or dead, it will be revived by this means; but the delicate agreeable flavour, or acidulous taste communicated by the fixed air, and which is manifest in water, will hardly be perceived in wine, or other liquors which have much taste of their own.

21. I would not interfere with the province of the physician, but I cannot entirely satisfy myself without taking this opportunity

nity to suggest such hints as have occurred to myself, or my friends, with respect to the *medicinal uses* of water impregnated with fixed air, and also of fixed air in other applications.

In general, the diseases in which water impregnated with fixed air will most probably be serviceable, are those of a *putrid* nature, of which kind is the *sea-scurvy*. It can hardly be doubted, also, but that this water must have all the medicinal virtues of Pyrmont water, and of other mineral waters similar to it, whatever they be; especially if a few iron filings be put to it, to render it a chalybeate, like genuine Pyrmont water. It is possible, however, that, in some cases it may be desirable to have the *fixed air* of Pyrmont water, without the *iron* which it contains.

Having this opportunity, I shall also hint the application of fixed air in the form of *clysters*, which occurred to me while I was attending to this subject, as what promises to be useful to correct putrefaction in the intestinal canal, and other parts of the
system

system to which it may, by this channel, be conveyed. It has been tried once by Mr. Hey above-mentioned, and the recovery of the patient from an alarming putrid fever, when the stools were become black, hot, and very fetid, was so circumstanced, that it is not improbable but that it might be owing, in some measure, to those clysters. The application, however, appeared to be perfectly easy and safe.

I cannot help thinking that fixed air might be applied externally to good advantage in other cases of a putrid nature, even when the whole system was affected. There would be no difficulty in placing the body so, that the greatest part of its surface should be exposed to this kind of air; and if a piece of putrid flesh will become firm and sweet in that situation, as Dr. Macbride found, some advantage, I should think, might be expected from the same antiseptic application, assisted by the *vis vitæ*, operating internally, to counteract the same putrid tendency. Some Indians, I have been informed, bury their patients, labouring under putrid diseases, up to the chin in fresh

D

mould,

mould, which is also known to take off the fœtor from flesh meat beginning to putrify. If this practice be of any use, may it not be owing to the fixed air imbibed by the pores of the skin in that situation? Following the plough is an old prescription for a consumption, as also is living near lime kilns. There is often some good reason for very old and long continued practices, though it is frequently a long time before it be discovered, and the *rationale* of them satisfactorily explained.

Being no physician, I run no risque by throwing out these random hints and conjectures. I shall think myself happy, if any of them should be the means of making those persons, whom they immediately concern, attend more particularly to the subject. My friend Dr. Percival has for some time past been employed in making experiments on fixed air, and he is particularly attentive to the medicinal uses of it; and from his knowledge as a philosopher, and skill in his profession, I have very considerable expectations.

CHAP.

C H A P T E R III.

Of Dr. NOOTH's Objections to the preceding Method of impregnating Water with fixed Air, and a Comparison of it with his own Method, both as published by himself, and as improved by Mr. PARKER.

I can easily forgive Dr. Nooth for his representing me as having no other merit than the *first publication* of the method for impregnating water with fixed air, accounting for it as I have done before; but I cannot so easily forgive another paragraph in his paper, the tendency of which is intirely to discredit a method, which, though it is, in some respects, inferior to his own, has nevertheless its peculiar advantages: and every advantage cannot possibly concur in any one method. He says, p. 59, “Independent of the inconveni-
“cies attending the process, there was
“another objection to the apparatus, which,
“with most people, might have consider-
“able weight. The *bladder*, which formed

“ part of it, was thought to render the
“ water offensive ; and when the solvent
“ power of fixed air is considered, it will
“ not appear improbable, that the water
“ would be always more or less tainted by
“ the bladder. In some trials which I
“ made with Dr. Priestley’s apparatus, it
“ always happened that the water acquired
“ an *urinous flavour* ; and this taste was,
“ in general, so predominant, that it could
“ not be swallowed without some degree
“ of reluctance.”

That Dr. Nooth *did* produce an impregnated water which he could not swallow without reluctance, and even that, in the trials to which he refers, he *generally* produced such water, I am far from doubting ; because that might happen from various causes. But that the urinous flavour came from the *bladder*, as such, I will venture to say is not possible. For then it would *always* have had the same effect ; and not only myself have never perceived such a flavour as the Doctor complains of, but this is the only complaint of the kind that I have hitherto heard of ; though many
persons

persons of the most delicate taste, and particularly many ladies, have used the water impregnated in my method for months together. Few persons have had to do with bladders, and fixed air confined in bladders, more than myself; and yet I have never seen any reason to suspect this great *solvent power* of fixed air with respect to them; especially so as to be apparent in the space of a few minutes.

But supposing the fixed air to be capable of dissolving the whole bladder, and to carry it along with itself into the impregnated water, no physician, or philosopher, will pretend to say that it could have any more tendency to give it an *urinous flavour*, than if it had been any other membrane of the animal body.

Indeed, as the Doctor himself does not pretend to say that this strange urinous flavour was the effect of *all* the impregnations of water made in my method, but only in *some* of them (though it was *generally* so, in those particular trials) it is evident, from his tacit confession, that it

must have been an *accidental thing*, and could not have come from the bladder, which I suppose he made use of in all trials. For he has not done me the justice to acknowledge that, in my pamphlet, among the various methods of effecting the impregnation of water, I have described one in which no bladder is made use of. When the Doctor shall once more produce this urinous flavour (and as a new and curious experiment, it is certainly worthy of his farther investigation) taking care that no careless servant shall have mixed any urine in the water that he calls for, I shall give this new objection to my process a farther examination. At present I am inclined to consider this as an experiment of the servant, rather than of the Doctor himself.

Several persons have thought that fixed air discharged from *impure chalk* gives the water that is impregnated with it a disagreeable flavour, but this I have never observed myself; and any other calcareous matter may be used in my method, as well
as

as in that of Dr. Nooth, who recommends chalk, as the best upon the whole.

I shall conclude these animadversions with doing what Dr. Nooth ought to have done before me, viz. fairly stating the advantages and disadvantages of our two methods. His method requires *less skill* in the operator, and *a less constant attention*. It is also *more elegant* and cleanly, I mean with respect to the *operator*; for this does not at all affect the *impregnated water*. On these accounts I generally recommend and make use of his method myself, especially as the glasses are made with improvements by Mr. Parker. But if Dr. Nooth be candid, he must acknowledge that my method requires much *less time*, and is much *less expensive*; and therefore must be more proper when a great quantity of impregnated water is wanted; and especially when there is but little room to make it in.

My method indeed requires a constant attendance, but I question whether, upon the whole, more than is necessary to be given

to Dr. Nooth's method at intervals, if the water be at all agitated; considering that mine does not require one-tenth part of the time. And though my method requires some little skill and address, it is not so much, but that many persons, altogether unused to experiments, have, to my knowledge, succeeded in it very well, and have made the impregnated water in a constant way for their family use, and without any assistance besides what they got from the printed directions. My apparatus costs little or nothing, because no vessels are made for the purpose; and both the chalk and the acids are made to go as far as possible, by means of the convenient agitation of the vessel in which they are contained. Whereas Dr. Nooth's method requires a peculiar and expensive apparatus, and more waste is unavoidable in the use of it. However, for the reasons above-mentioned, I have never recommended my own method for the use of a family since I have been acquainted with his.

What I have said above is rather applicable to the apparatus as it is made by
Mr.

Mr. Parker, than to that which Dr. Nooth has described. For Mr. Parker's glasses are, in my opinion, considerably improved from those of Dr. Nooth. It may be said that the improvements consist in *little things*; but little things may have great effects; and, after the discovery of the *first method* of accomplishing this end, all *subsequent methods* may be called little things; and they may be endlessly diversified, without any great claim of merit. I have seen several very ingenious methods since the publication of mine, though none that I like so much, upon the whole, as that of Dr. Nooth, improved by Mr. Parker.

In Dr. Nooth's apparatus, if any more air than is wanted be produced, the water will run out of the uppermost vessel. To use his own words, p. 63, "Should more
" air be extricated than is sufficient, in
" the conduct of the process, to fill that
" vessel, the water will run over the top
" of it, and will continue to run as long
" as any air ascends in the middle vessel,
" or 'till the surface of the water is below
" the extremity of the bent tube; and in
" this

“this case the whole would be wet and disagreeable.” But this disagreeable consequence can never happen in the use of Mr. Parker’s glasses, because the bent tube in which the uppermost vessel terminates is made of such a length, that the water expelled from the middle vessel can do no more than nearly fill the uppermost, and can never run over; so that whereas Dr. Nooth’s apparatus requires a constant attendance, Mr. Parker’s requires none. The materials being once put into it, the process will go on of itself, without any farther care; unless the operator should chuse to accelerate the impregnation by now and then letting out the air that is not easily absorbed, and by agitating the water. This I think to be a considerable advantage gained by a very easy contrivance of Mr. Parker’s, overlooked by Dr. Nooth.

Mr. Parker derives another considerable advantage from a *channel* which he cuts in the stopper of his uppermost vessel, or from a stopper with a hole through the middle, which Dr. Nooth has not in his; so that either the operator must be careful to take it

it out during the effervescence, or it will be driven out, or some of the vessels will burst, to the great danger of the bystanders; which actually happened in one made by Mr. Parker, before he thought of this method to prevent it. Whereas, through the channel in Mr. Parker's apparatus, the common air easily escapes from the uppermost vessel, to make room for the water to ascend; and when, in the continuance of the process, the fixed air rises through the bent tube into the uppermost vessel, it lodges upon the surface of the water in it; and the communication between it and the common air being so much obstructed, they are sufficiently separated; so that even the water in the uppermost vessel has (if the production of air be copious) almost as much advantage for receiving the impregnation, as that in the middle vessel. This advantage Dr. Nooth loses.

Also, when he chuses to separate the two uppermost vessels from the lowest, in order to agitate the water, he must either leave the mouth of the uppermost vessel open,
in

in which case he can hardly agitate the water at all; or (as he prefers to do it) he must put the stopper in, and consequently admit the common air to pass his valve, and mix with the fixed air, which must greatly retard the absorption of it: whereas Mr. Parker's vessels may be agitated with the stopper in, which, admitting the common air into the upper vessel, through the channel cut in it (or through the hole of the stopper) permits the water to descend into the lower, on the surface of which nothing but fixed air is incumbent. Should any common air enter by the valve, which in this case it hardly would, the finger of the person who shakes the vessel may easily be placed so as to prevent it.

Lastly, I consider it as a valuable improvement in Mr. Parker's apparatus, that, by means of the openings into the middle and lowest vessels, closed with ground stopples, the operator is enabled to draw off his water, in order to taste it occasionally, or to add to his oil of vitriol or chalk, &c. at pleasure, without giving himself

himself the trouble of separating the vessels from one another for those purposes.

The first apparatus that I saw of Mr. Parker's had no *valve* at all, but only a glass stopple, with one or more small perforations, for the ascent of the air into the middle vessel. This I still generally make use of, without finding any occasion for a valve; the ascent of the fixed air sufficiently preventing the descent of the water, as long as the process continues, especially when pounded *marble* is used. This substance Dr. Franklin recommended to me, and I give it the preference very greatly to chalk, chiefly on account of the length of time that is required to expel the air from it: For without any fresh acid, it will often continue to yield air for several days together.

That those persons who are not possessed of the English *Philosophical Transactions*, and particularly foreigners, may understand what has preceded, I shall give a drawing of Dr. Nooth's

Nooth's apparatus, † as improved by Mr. Parker, with the following general description of it.

In the lowest vessel, the chalk or marble, and the water acidulated with oil of vitriol, must be put, and into the middle vessel the water to be impregnated. During the effervescence, the fixed air rises into the middle vessel, and rests upon the surface of the water in it, while the water that is displaced by the air rises through the bent tube into the uppermost vessel, the common air going out through the channel in the stopple. When the bent tube is of a proper length, the process requires no attention; and if the production of air be copious, the water will generally be sufficiently impregnated in five or six hours. At least, all the attention that needs be given to it is to raise the uppermost vessel once or twice, to let out that part of the fixed air which is not readily absorbed by water. If the operator chuse to accelerate the process, by agitating the water, he must separate the two uppermost vessels from the lowest.

† Fig. 2.

lowest. For if he should agitate them all together, he will occasion too copious a production of air; and he will also be in danger of throwing the liquor contained in the lowest vessel into contact with the stopple which separates it from the middle vessel, by which means some of the oil of vitriol might get into the water.

*End of the Extract from Dr. PRIESTLEY's
Experiments on Air, Vol. II.*

A P P E N D I X.

*Dr. NOOTH's Method of IMPREGNATING
WATER with FIXED AIR, as improved
by Mr. PARKER, Mr. MAGELLAN,
&c.*

Description of the Apparatus.

See Fig. 4.

IT is made of glass, and stands on a wooden vessel *d d* resembling a tea-board, to catch any water that may chance to be spilled, and prevent it from falling on the table. The middle vessel *B* has a neck which is inserted into the mouth of the vessel *A*, to which it is ground air-tight. This lower neck of the vessel *B*, has a glass stopple *S*, composed of two parts, both having holes sufficient to let a good quantity of air pass through them. Between these two parts (which may be considered as two stopples) is left a small space, containing a plano convex lens,

(that is, a glass round on one side and flat on the other) which acts like a valve, in letting the air pass from below upwards, and hindering its return into the vessel A.

The upper vessel C terminates below in a tube *r t*, which being crooked, hinders the immediate ascent of the bubbles of fixed air into that vessel, before they reach the surface of the water in the vessel B. The vessel C is also ground air-tight to the upper neck of the middle vessel B, and has a stopple *p* fitted to its upper mouth, which has an hole through its middle. The upper vessel C holds just half as much as the middle one B; and the end *t* of the crooked tube, goes no lower than the middle of the vessel B.

The Process.

Fill the middle vessel B with spring, or any other clean and wholesome water, and join to it again the upper vessel C. Pour water into the vessel A (by the opening *m*, or otherwise) so as to cover the rising
part

part of its bottom. About three quarters of a pint, or a little more, will be sufficient. Fill an ounce phial with oil of vitriol, and add it to the water, shaking the vessel so as to mix them well together. As heat is generated, it will be better to add the oil by a little at a time, otherwise a hazard is run of breaking the vessel. Put to this, through a wide glass, or paper funnel, about an ounce of powdered raw chalk, or marble *. The funnel must be used in order to prevent the powder from touching the inside of the vessel's mouth ;

E 3

for

* White marble being first granulated, or pounded like coarse sand, is much better for the purpose than pounded chalk, because it is harder ; and therefore the action of the diluted acid upon it is slower, and lasts a very considerable time. The supply of fixed air from it is therefore much more regular than with the chalk. In general, it continues to furnish fixed air more than twenty-four hours. When no more air is produced, if the water be decanted from the vessel A, and the white sediment washed off, the remaining granulated marble may be employed again by adding to it fresh water, and a new quantity of oil of vitriol. A farther produce of fixed air will then be furnished, and this may be repeated until all the marble be dissolved.

for if that happens, it will stick so strongly to the neck of the vessel B, as not to admit of their being separated without breaking. Place immediately the two vessels B and C (fastened to each other) into the mouth of the vessel A, as in the figure, and all the fixed air which is disengaged from the chalk or marble by the oil of vitriol, will pass up through the valve in S into the vessel B. When this fixed air comes to the top of the vessel B, it will dislodge from thence as much water as is equal to its bulk; which water will be forced up through the crooked tube into the upper vessel C.

Care must be taken not to shake the vessel A when the powdered chalk is put in; otherwise a great and sudden effervescence will ensue, which will perhaps expel part of the contents. In such case it may be necessary to open a little the stopple *p*, in order to give vent, otherwise the vessel A may burst. It will be proper also to throw away the contents, and wash the vessel; for the matter will stick between the necks of the vessels, and cement them together.

together. The operation must then be begun afresh. But if the chalk be thrown in without shaking the machine, or if marble be used, the effervescence will not be violent. If the chalk be put into the vessel loosely wrapt up in paper, this accident will be still better guarded against. When the effervescence goes on well, the vessel C will soon be filled with water, and the vessel B half filled with air; which will easily be known to be the case by the air going up in large bubbles through the crooked tube *r t*.

When this is observed, take off the two vessels B and C together as they are, and shake them so that the water and air within them may be much agitated. A great part of the fixed air will be absorbed into the water; as will appear by the end of the crooked tube being considerably under the surface of the water in the vessel. The shaking them for two or three minutes will be sufficient for this purpose. These vessels must not be shook while joined to the under one A, otherwise too great an effervescence will be occasioned in the latter;

together with the ill consequences above-mentioned. After the water and air have been sufficiently agitated, loosen the upper vessel C, so that the remaining water may fall down into B, and the unabforbed air pass out. Put these vessels together, and replace them into the mouth of A, in order that B may be again half filled with fixed air. Shake the vessels B and C, and let out the unabforbed air, as before. By repeating the operation three or four times, the water will be sufficiently impregnated.

Whenever the effervescence nearly ceases in the vessel A, it may be renewed by giving it a gentle shake, so that the powdered chalk or marble at the bottom may be mixed with the oil of vitriol and water above it; for then a greater quantity of fixed air will be disengaged.

When the effervescence can be no longer renewed by shaking the vessel A, either more chalk must be put in, or more oil of vitriol; or more water, if neither of these produce the desired effects.

The

The ingenious Mr. Magellan has still farther improved the contrivance of Dr. Nooth and Mr. Parker. He has two sets of the vessels B and C. While he is shaking the air and water contained in one of these sets, the other may be receiving fixed air from the vessel A. By this means twice the quantity of water may be impregnated in the same time. He has a wooden stand K (Fig. 5.) to fix the vessels B C on, when taken off from A, which is very convenient. He has a small tin trough for measuring the quantity of chalk or marble requisite for one operation, and a wide glass funnel for putting it through into the vessel A, to prevent its sticking to the sides, as mentioned before.

He has also contrived a stopple without an hole to be used occasionally instead of the perforated one *p*. It has a kind of basin at the top to hold an additional weight when necessary. (See Fig. 6.) The stopple must be of a conical figure, and very loose; but so exactly and smoothly ground as to be air-tight merely by its pressure, which may be encreased by additional weights put into its

its bason. Its use is to compress the fixed air on the water, and thereby encrease the impregnation. For by keeping the air on the water in this compressed state, the latter may be made to sparkle like Champaign. And if the vessels are strong, there will be no danger of their bursting in the operation.

If the vessels be suffered to stand six or eight hours, the water will be sufficiently impregnated even without agitation. But by employing the means above described, it may be done in as many minutes.

The water thus impregnated may be drawn out at the opening *k*. But if it is not wanted immediately, it will be better to let it remain in the machine, where it has no communication with the external air. Otherwise the fixed air flies off by degrees, and the water becomes vapid and flat; as also happens to other acidulous waters. But it may be kept a long time in bottles well stopped, especially if they are placed with their mouths downwards.

This

This water is more pleasant to the taste than the natural Pyrmont or Seltzer waters; as besides their fixed air, they contain saline particles of a disagreeable taste, which are known to contribute little or nothing to their medicinal virtues; and may, in some cases, be hurtful. The artificial water is also double the strength of the natural; the latter containing scarce half of the fixed air which can thus be communicated to the former.

N. B. Mr. Blades, of Ludgate Hill, has still further improved this apparatus, by changing the stopple at *k* for a glass cock, which is more convenient. He has likewise altered the middle vessel B into a form more advantageous for the impregnation. See Fig. 7.

A Method

A Method of imitating the SULPHUREOUS Mineral Waters, by impregnating Water with SULPHUREOUS AIR.

We may imitate the *sulphureous* mineral waters, as well as the *acidulous* ones, or those impregnated with fixed air. The process is sufficiently simple; and the same apparatus will serve for both.

Instead of limestone, chalk, or marble, *liver of sulphur* is to be used. It may be bought ready prepared of the chymists or apothecaries; or may easily be prepared as follows:

Mix together equal parts of brimstone, and of clean pot ashes *, and place them in a crucible, or unglazed dish, over a very gentle fire. Keep them stirring with a stick 'till they are united together into a blood-red mass.

* Quick lime may be used instead of pot ashes, taking care to chuse it well burnt.

mass. Put it, while warm, into a bottle, which is to be kept well closed.

Put a sufficient quantity of this substance, with the oil of vitriol and water, into the part A of the apparatus, and proceed as described in the process for impregnating water with fixed air; the *sulphureous* air will arise; the water in the middle vessel B will be impregnated with it, will smell strongly sulphureous, and resemble the celebrated waters of *Aix la Chapelle*, &c. in the same manner as those impregnated with fixed air resemble those of *Pyrmont* and *Seltzer*.

The water thus impregnated may be heated, by putting it into a close vessel, placed in one that contains boiling water, and it is then a *warm sulphureous water*.

If it be not used immediately, it should be preserved in glass or stone bottles, well corked, and cemented, and placed with the corks downward in a cellar.

To imitate more exactly the several Mineral Waters.

This consists only in adding to the water to be impregnated, the solid matters which they are found to leave behind on evaporation. For example :

I.

P Y R M O N T W A T E R.

Add to the water in the middle vessel B, in the proportion of about thirty grains of Epsom salt, ten grains of common salt, a scruple of magnesia alba, and a dram of iron filings, or iron wire, clean and free from rust, to one gallon of spring water, and impregnate the whole with fixed air in the manner described. Let them remain 'till the other ingredients, and as much of the iron as is necessary, are dissolved, which will be in two or three days ; or the magnesia may be omitted, and then the operation will be finished in less than half that time.

2. S P A W

2.

SPA W A T E R.

Take of the fossil alkali, or sal sodæ, a scruple, of common salt twelve grains, spring water a gallon ; impregnate them with fixed air ; a few iron filings must also be added.

3.

S E L T Z E R W A T E R.

Take of the fossil alkali a scruple, common salt about the same quantity, magnesia one scruple, spring water a gallon, and impregnate them with fixed air. Or it may be made without the magnesia.

4.

SEIDSCUTZ PURGING WATER,
(resembling our Epsom.)

Take of Epsom salt three ounces, water a gallon, and impregnate them with fixed air.

4. AIX-

5.

AIX-LA-CHAPELLE WATER.

Take of sea salt half a dram, fossil alkali a dram, clean chalk a scruple, water a gallon. Impregnate them with sulphureous air.

Other waters may in like manner be imitated by adding Epsom salt for purging waters, sea salt for salt waters, &c. And as some waters (as the cold sulphureous ones) contain both *fixed* and *sulphureous* air, a mixture of liver of sulphur and chalk may be put into the vessel A with the oil of vitriol, by which means both these airs will be produced, and the water of course impregnated with them.

AN
ACCOUNT
OF THE
NATURE, PROPERTIES,
AND
MEDICINAL VIRTUES
OF THE
Principal Mineral Waters
IN
GREAT BRITAIN AND IRELAND;
AND OF THOSE
MOST IN REPUTE IN FOREIGN PARTS.

Digested into Alphabetical Order.

By JOHN ELLIOT, M.D.

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IN
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INTRODUCTION.

THE following treatise on Mineral Waters being intended for the Public in general, the Editor has endeavoured to couch it in such terms as that it may be understood by those who are unacquainted with the art of physic. Such an account has been judged by many very proper to be subjoined to the foregoing dissertation.

All the mineral waters in *England*, of any note, will be found noticed in this tract: together with their virtues, and the method, and season of using them, so far as could be learnt from the authors who have been consulted on the occasion. To these are added all the principal mineral waters of *Scotland* and *Ireland*, as well as the most celebrated ones which the English valetudinarian may have occasion to visit on the continent.

The greatest part of the books which have hitherto been written on this subject, abound with experiments tending to shew the

analysis of those waters. But this can be of little use except to the faculty ; and must be dry, and perfectly uninteresting to common readers. Besides, the necessity of such accounts is superseded by specifying the ingredients themselves with which the waters are impregnated, and their virtues as medicines ; to shew which is the sole end of these experiments. It would also have swelled the volume to an unwieldy size. For this last reason, as also because it was judged wholly unnecessary and superfluous, the descriptions of the places in which the respective waters are situated, are likewise omitted.

For the convenience of the reader, the waters are arranged in *alphabetical* order, by which means they will the more readily be found. I wonder indeed that this method is not observed by authors on many other occasions. For though there be a systematical arrangement of the things treated of in their books, yet the reader is, after all, obliged to refer to an *index* ; which in fact is an alphabetical arrangement of the particulars of the subject,

The

The reader will find accounts of a great number of waters which he probably never heard of before. As many of those are of similar virtues to others which are more famous, the invalid will be instructed where to find a mineral water proper for his complaint near at hand, when it might not be convenient for him, on account of the distance, or otherwise, to repair to those of greater *note*, though perhaps not of superior *virtue*.

For this purpose also, as well as for the more readily finding out waters of particular virtues, these waters are classed or arranged according to their respective mineral properties; as will presently be seen.

Water is usually reckoned by philosophers a simple element; but, from the nature of the soil over which it passes, and other accidents to which it is exposed, it is always more or less impregnated with foreign particles. According to the nature of these particles, the properties of the water are different. Hence we have *hard* water, *soft* water, *salt* water, and the almost infinite

variety of *mineral* waters. The principal of the latter, in this part of the world, will be found noticed in the following tables :

1st. CHALYBEATE WATERS.

Hampstead	Peterhead
Carlton	Glendy
Islington	Aberbrothick
Leez	Cobham
Markshall	Tunbridge
Felstead	Buxton
Wellenbrow	Millar's Spaw
Aylesham	Latham
Malvern	Tibshelf
Colurian	Chippenham
Harrogate	Witham
Road	Lancaster
Ilmington	Whiteacre
Birmingham	West Ashton
Cannock	Cawthorp
Moss House	Derby
Wigan	Weatherstack
Sene	Filah
Thetford	Dortshill
Lincomb	Stanger
Llandrindod	Dunse
	Castle

Castle Connel	Dunnard
Tralee	Maccroomp
Granshaw	Wexford
Newton Stewart	Ballyspellan
Galway	Nezdenice
Coolauran	Kuka
Lisdonvarna	Spaw
Ballycastle	Zahorovice
Glanmile	Bromley
Kanturk	

Chalybeate waters are the most useful and beneficial to health of any of the mineral waters; and are very plentiful in this island.

Waters are known to be chalybeate by their striking a reddish purple, or black colour with an infusion of galls; and according to the height of the colour, provided the strength of the infusion be the same, we judge of the strength of the water as a chalybeate.

The iron in those waters is held in solution by means of fixed air, as may be judged from what has been already

said on this subject. As the fixed air soon flies off on exposing the water, the iron falls to the bottom in form of a brownish yellow powder. Hence these waters strike the deepest black with galls at the spring head; and in time they wholly lose that property.

They have a brisk acidulous or vinous taste when fresh, and tinge the stools black.

Taken inwardly they strengthen the constitution in general, encrease the tone of the fibres, quicken the circulation, and restore a proper consistence to the blood when in a too thin and watery state. And hence they are found to invigorate the whole frame. They are good in diseases arising from weakness. In spasmodic disorders, arising from too great irritability and relaxation of the nervous system. In fluor albus, and gleets; in female obstructions; in hysteric and hypochondrical disorders; in loss of appetite and digestion; and in a variety of other complaints, as will be specified

fied in treating of the respective waters ; they differing somewhat in their virtues.

Previous to a course of these waters, bleeding, and a cooling purge, may be necessary, in case of heat and fever ; and costiveness should also be avoided while drinking them. Where there is much fever, and also in ulcers of the lungs, and in confirmed obstructions attended with fever, the use of these waters is improper.

Patients ought to begin with drinking a small quantity of these waters every morning, and gradually to increase the dose. A temperate and moderate diet, and gentle exercise should also be observed while taking them.

If the waters are too cold for the stomach, a little warm water may be mixed with them just before drinking.

Acids, tea, and other things, which decompose these waters, should not be taken for some time before or after drinking them.

Besides

Besides iron, these waters usually contain sea salt, the fossil alkali, a purging salt, or other substance, as will be noticed when treating of them.

2d. CHALYBEATE PURGING WATERS.

Knowsley	Stoke
Burlington	Woodham Ferris
Astrop	Hanlys
Coventry	Athlone
Bournley	Mount Pallas
Townley	Killinshanvally
Newham Regis	Cleves
Binley	Driburg
Kingscliff	Hoff Geismar
Thirsk	Pyrmont
Hartlepool	Egra
Thornton	Nevil Holt
Orston	Ballycastle
Stenfield	Deddington
Kirby	Drig-Well
Tarleton	Inglewhite
Malton	Gainfborough
Aswarby	Thorp Arch
Scarborough	Castlemain
Cheltenham	Ballynahinch
Bagnigge	Jeffop

These

These chalybeate waters contain a greater proportion of purging salt than of any other solid matter, and therefore when taken in sufficient quantity (several pints) they operate by stool. They have this advantage over other purges, that they do not exhaust the strength.

If taken in less quantity, as alteratives, they operate chiefly by urine, and then they fall rather under the first class of these waters than the present.—*See what was said of chalybeate waters.*

3d. SULPHUREOUS WATERS.

Sutton Bog	Mechan
Wiglesworth	Ashwood
Chadlington	Derryhence
Bilton	Drumasnave
Queen Camel	Anaduff
Nottingham	Aphaloo
Drumgoon	Harrogate
Swadlingbar	Maudsby
Derrylester	Cricklespaw
Lisbeak	Broughton
Killasher	Shettlewood

Reddle-

Reddlestone	* Aix la Chapelle
Durham	* Borset
Wardrow	* Chaude Fontaine
Skipton	* Bareges
Rippon	* Baden Baden
Llandrindod	* Bath
Moffat	* Matlock
Carstarphin	

Waters called *fulphureous* do not contain an actual sulphur, but are impregnated with a gas, or spirit (the sulphureous air already described) which gives them their sulphureous smell. Besides this, they usually contain either the fossil alkali, sea salt, a purging salt, iron, an earth, or other matter, and commonly several of these in different proportions.

Waters of this sort are diuretic, and strongly diaphoretic, and are therefore good in cutaneous diseases, used both internally and externally. They are also good in chronic obstructions; and in disorders proceeding from acidity, from worms, &c.

They usually make silver appear of a copper colour.

4th. SUL-

4th. SULPHUREOUS PURGING WATERS*.

Askeron	Shapmoor
Croft	Upminster
Cawley	Codsalwood
Cunley House	Wirksworth
Buglawton	Derrindaff
Loansbury	Owen Bruen
Normanby	Pettigoe

These waters differ from those in the preceding class in containing a purging salt as the principal solid ingredient, and therefore operating by stool. They are good in the same disorders as the alterative sulphureous waters, as also for foulnesses of the bowels, &c.

5th. ACIDULOUS, OR SALINE WATERS.

Seltzer	St. Bartholomew
Tilbury	Cape Clare
Clifton	Buch
Glastonbury	Tonstein
Toberbony	* Mount d'Or
Carrickmore	

The

* Some of the chalybeate purging waters are also sulphureous.

The waters of this class contain the fossil alkaline salt. This salt, as the waters are taken up from the fountain, is saturated, or rather supersaturated, with fixed air; hence the waters do not then manifest any alkaline quality; on the contrary, they curdle with soap, and are termed *acidulæ*. This *fixed air*, or *aërial acid*, however, being very volatile, soon exhales when the water is heated, or stands awhile exposed, and then the alkali manifests itself.

The general virtues of these waters may be known from what is said in the alphabet, under the article SELTZER WATER.

6. SALINE PURGING WATERS.

Barrowdale	Dulwich
Leamington	Holt
New Cartmal, or	Stretham
Rougham	Kilburn
St. Erasmus	Moreton-fee
Cargyrle	Hanlys
Dortshill	Conmer
Alford	Bagnigge
	Barnet

Barnet	Seidlitz
North-hall	* Balaruc
Acton	Sea Water
Epsom	Dog and Duck
Alkerton	Kinalton
Ball, or Bandwell	Brentwood
Llandrindod	Colchester
Kenfington	Sydenham
Richmond	Carrickfergus
Upminster	* Bagniers

These waters are impregnated with sea salt, and also with a purging salt; either the *calcareous Glauber's*, or the *Epsom*.

They differ in strength; some of them purge sufficiently in the quantity of a pint; while two, three, four, five, or six pints of others are necessary to produce that effect. Some again are so weak as to require the addition of Glauber's salt, or other purgative.

Given in small quantities they act as diuretics and alteratives.

They

They are good in scrophulous and scorbutic complaints, ulcers, and other diseases which make their appearance on the skin, and are likewise used as baths, and fomentations in these and other disorders.

The virtues of the preceding class of waters depend in a great measure on the presence of their *fixed air*. The waters of the present class seem to derive their virtues principally from the saline matters which they contain.

7. VITRIOLIC WATERS.

Shadwell

Hartfel

Westwood

Cross-town

Swanzy

Nobber

Haigh

Cashmore

Vahls

Kilbrew.

These waters are impregnated with green vitriol or copperas, and strike a black colour with galls.

They are chiefly used outwardly for washing old sores and the like, and frequently
with

with good effect. In some cases, however, they are taken inwardly in small doses, and then they prove emetic and purgative.

8. WATERS WHICH CONTAIN AN EARTH.

Newton-dale	* Bristol
Bale	* Buxton
Knareborough	* Mallow.
Glavely	

The cold waters of this class have a petrifying quality. The virtues of the waters of this class being different, the reader is referred to the respective articles in the alphabet for an account of them.

The above arrangement of mineral waters is intended more for the convenience of the reader not versed in physic, than as a *systematical* one.

Had the latter idea been adopted, it would have been necessary perhaps to have made a division of the waters into *hot* and *cold*, in imitation of the learned Dr. Donald Monro; from whose ingenious work, together with those of Dr. Short, Dr. Ratty, and a few
G others,

others, the following treatise has been chiefly compiled. †

There are a great number of *cold* mineral waters in England ; but the number of the *hot* ones is very small. In the above catalogue, the *latter* are distinguished from the *former* by having an ASTERISM placed before them. Those of greatest note on the continent however are also noticed ; in many parts of which they abound.

The cause of the heat of those waters is, in some instances, subterraneous fire ; as is the case with some which are situated near volcanos. In other cases the heat arises from the mineral ingredients with which they are impregnated in their passage. And the same may be said of those waters which are *cooler* than the common temperature of the atmosphere. Thus it is known, that quick-lime, the pyrites stone, and other substances, thrown into water will make it *warm*. On the contrary, salts of various kinds make it *colder* than before.

The

† The quantity of waters to be drank, and some other particulars, are not always mentioned by authors, but they may easily be learnt on the spot

The *warm* waters possess many of the virtues and properties of *cold* waters of the same class, and which are impregnated in the same manner ; but they are preferable in many cases, as from their warmth they are more kindly and agreeable to the stomachs of weak people, and promote perspiration.

The warm waters are also used as warm baths, and may in general be considered as warm medicated baths; and these by relaxing the fibres, are of use in a variety of disorders which take their rise from rigidity, and from spasm, as also from other causes. Hence their great use in rheumatisms, inflammations, costiveness, &c. The cure is usually assisted by the internal use of those waters at the time.

For complaints of a particular part of the body, either the part is fomented with the warm water, or the water is raised to an height by pumps, or otherwise, and then let fall with force on the diseased part ; this is called *pumping* by the English; the French term it the *Douche*.

Contrivances are also used for raising these waters into *vapour* or *steam*, and confining it

so that it may be applied to the whole body, or to particular parts. These contrivances are called *vapour baths*.

Baths are likewise made of the mud found at the bottom of these waters; and they have been found serviceable in removing pains, and aches; and paralytic, and other complaints. The mud is either rubbed on the part, or the part is immersed in it, as may be judged convenient or proper; when it is collected in quantity in a reservoir for these purposes, it is called the *mud bath*.

The cold waters are also, in some cases, used externally.

I shall conclude this introduction by mentioning some of the most obvious methods of analyzing, or discovering the nature of mineral waters.

1. Waters are known to contain *iron*, by their exhibiting a purple or black colour with the infusion of galls; and the quantity of iron which they contain, that is, their strength as chalybeate waters, is determined by the deepness of the colour; the quantity and strength of the infusion being the same. If the iron be held in solution by
fixed

fixed air, the latter will fly off on exposing the water in an open vessel, and then the iron will fall to the bottom in the form of a yellowish or reddish brown powder, or *oker*. But if the iron be held in solution by the vitriolic acid, in the form of green vitriol, or copperas, this precipitation of oker does not take place. The chalybeate water may also be known to be vitriolic by its austere styptic taste.

2. If, on the addition of syrup of violets to a water, it turns to a *bright green*, it shews that an alkaline salt is contained in the water, and the only alkaline salt ever found in mineral water is the *fossil*.

When this kind of water, however, is first taken up from the well, the alkaline salt is usually saturated with fixed air, and therefore does not change syrup of violets green. It is frequently even *super-saturated* with fixed air, and therefore turns the syrup red. But the air soon flies off on exposure, and then the effect is as above-mentioned, the water is also found softer than common water, and lathers better with soap.

But earthy and metallic substances also change syrup of violets green. To be certain therefore that it is the fossil alkali, add a little fixed alkaline salt, and if no powder falls to the bottom, and the water does not become turbid, it may be concluded that it is the *fossil alkali* with which the water is impregnated.

3. If on the addition of syrup of violets a *red* colour is observed, the water contains an *acid*. Thus, fixed air is an acid, and when waters which are strongly impregnated with fixed air, are first taken up from the fountain, they are found to change syrup of violets red. As the air flies off, however, this redness disappears, and if the water also contained an alkali, it will, on the further escape of the fixed air, turn green, for the reason given in the last article.

4. If water contains *sea salt*, oil of vitriol dropt into it will cause *white noxious fumes* to arise; which is the acid of the sea salt, whose place the vitriolic acid had taken in the alkaline basis of the sea salt.

If

If a sufficient quantity of the oil of vitriol be added, and the water be evaporated, not sea salt but a true Glauber's salt will remain behind.

Also the residuum of these waters crackles and flies when placed on a red-hot iron.

5. If a mineral water contains that kind of purging salt, which the chemists call *calcareous Glauber's*, or the *Epsom* salt, (the purging salts usually found in mineral waters) a solution of fixed alkali added will make the water turbid, and the earthy basis of the salt will fall to the bottom in form of a white powder.

6. Sulphureous waters are known by their smell, and by their changing silver of a reddish copper colour.

7. If water contains an earth deprived of fixed air, it may be discovered by adding fixed air to it; for then the water will become turbid, and the earth will fall to the bottom. If, on the contrary, it contains an earth supersaturated with fixed air, * draw-

G 4

ing

* There is a famous water of this kind, in Rathbone-place, London.

ing part of it away by the air pump, or exposing the water to the air, or to warmth, will also precipitate the earth.

Waters in general contain several kinds of these solid matters, and therefore more than one of these methods are to be employed in detecting them.

8. Water may be known to contain fixed air by its sparkling on being poured from one vessel to another, by the explosion which follows on its being shook in a phial half filled with it, and by the bubbles which arise when placed over the fire, long before it is hot enough to boil.

The solid matters contained in waters may also be known by evaporating the waters and examining their residuums. But as this requires some knowledge of chemistry, it need not here be entered upon; the design of this treatise being rather to describe the medicinal virtues of mineral waters than their contents.

A N
A C C O U N T
O F T H E
M E D I C I N A L V I R T U E S , & c.
O F
M I N E R A L W A T E R S.

A B C O U R T,

Near St. Germain's, four leagues from Paris.

IT is a brisk chalybeate water, impregnated with fixed air, and the fossil alkali; and resembles the waters of *Spaw* and *Ilmington*.

A B E R B R O T H O C K,

In Scotland.

It is a chalybeate water, similar to those of *Peterhead* and *Glendy*.

A C T O N,

A C T O N,

Near London, in the County of Middlesex.

The wells are much frequented in May, June, and July.

The water is clear, and without smell. But its taste is somewhat bitterish like a solution of Epsom salt.

It contains a purging salt, together with sea salt.

It is one of the strongest purging waters about London; and is noted for causing a great forenefs in the fundament.

A G H A L O O, or A P H A L O O,

In the County of Tyrone, Ireland.

It is a sulphureous water of the same kind with that of *Swadlingbar*, but stronger. Like that, it is also impregnated with the fossil alkali, and a small quantity of purging salt.

AIX-LA-CHAPELLE*,

In the Duchy of Juliers, Germany.

This place has long been famous for its hot sulphureous waters and baths. They arise

* My friend, the ingenious Dr. Simmons, F.R.S. who made many experiments on the waters during his residence at this place, has favoured me with an account of their several temperatures, as repeatedly observed by himself, with a thermometer constructed by Nairne.

The spring which supplies the Emperor's bath (*Bain de l'Empereur*) the New Bath (*Bain Neuf*) and the Queen of Hungary's bath (*Bain de la Reine de Hongrie*) ————— 127°

St. Quirin's bath (*Bain de St. Quirin*) ————— 112°

The Rose bath (*Bain de la Rose*) and the Poor's bath (*Bain des Pauvres*) both which are supplied by the same spring ————— 112°

Charles's bath (*Bain de Charles*) and St. Corneille's bath (*Bain de St. Corneille*) ————— 112°

The spring used for drinking is in the High Street, opposite to Charles's bath; the heat of it at the pump is ————— 106°

arise from several sources, which supply eight baths constructed in different parts of the town.

These waters near the sources are clear and pellucid; and have a strong sulphureous smell resembling the washings of a foul gun; but they lose this smell by exposure to air. Their taste is saline, bitter, and urinous. They do not contain iron. They are also neutral near the fountain, but afterwards are manifestly, and pretty strongly alkaline, infomuch that cloaths are washed with them without soap.

The heat of these waters is upwards of 100 degrees of Fahrenheit's thermometer.

They are at first nauseous and harsh, but by habit become familiar and agreeable. At first drinking also they generally affect the head,

Their general operation is by stool and urine, without griping or diminution of strength; and they also promote perspiration.

The

The quantity to be drank as an alterative, is to be varied according to the constitution, and other circumstances of the patient. In general, it is best to begin with a quarter, or half a pint in the morning, and encrease the dose afterwards to pints, as may be found convenient. The water is best drank at the fountain. When it is required to purge, it should be drank in large and often repeated draughts.

In regard to bathing, this also must be determined by the age, sex, strength, &c. of the patient, and by the season. The degree of heat of the bath should likewise be considered. The tepid ones are in general the best, though there are some cases in which the hotter ones are most proper. But even in these it is best to begin with the temperate baths, and encrease the heat gradually.

These waters are efficacious in diseases proceeding from indigestion, and from foulness of the stomach and bowels. In rheumatisms; in the scurvy, scrophula, and diseases of the skin; in hysteric, and hypochondriacal

pochondriacal disorders ; in nervous complaints and melancholy ; in the stone and gravel ; in paralytic complaints ; in those evils which follow an injudicious use of mercury, and in many other cases.

They ought not however to be given in hectic cases where there is heat and fever, in putrid disorders, or where the blood is dissolved, or the constitution much broken down.

ALFORD, or AWFORD,

In Somersetshire, about 24 miles southward of Bath.

This salt spring was discovered in 1670, from the pigeons which flew thither in great numbers to drink the water : those birds being known to be fond of salt.

It contains a purging salt, together with a portion of sea salt.

It is strongly purgative.

It

It is recommended as cooling, cleansing, and attenuating. As a good remedy in the scurvy, jaundice, and other glandular obstructions. It also promotes urine and sweat, and therefore is good in gravelly and other disorders of the kidneys and bladder; and in complaints arising from obstructed perspiration.

A L K E R T O N,

In Gloucestershire, near the City of Gloucester.

It is a purging water, of the nature of those of *Dulwich*, and *Epsom*.

A N A D U F F,

In the County of Leitrim, Ireland.

It is a sulphureous water, of the same kind with those of *Killasher* and *Drumasnave*, but weaker.

A N T O N I A N.

See Tonstein.

A S H-

A S H W O O D,

In the County of Fermanagh, Ireland.

It is a sulphureous water; and contains the fossil alkali, with a small quantity of purging salt.

In its virtues it resembles the waters of Drumgoon and Swadlingbar.

A S K E R O N,

Five Miles from Doncaster, in Yorkshire.

It is a strong sulphureous water, and is slightly impregnated with a purging salt.

It is recommended internally and externally in strumous and other ulcers, scabs, leprosy, and similar complaints.

It is good in chronic obstructions, and in cases of worms and foulness of the bowels.

It operates by stool and urine.

A S T R O P E,

A S T R O P E,

Near Banbury, in Oxfordshire.

It is a brisk, spirituous, pleasant tasted chalybeate water, and is also gently purgative.

It should be drank from three to five quarts in the forenoon.

It is recommended as excellent in female obstructions, the gravel, hypochondriac, and similar disorders.

A S W A R B Y,

Seven Miles from Grantham, in Lincolnshire.

It is a fine blueish chalybeate water, and is gently laxative without occasioning griping or faintness, or a pain in the fundament; which is a common effect of waters impregnated with sea salt. In its virtues it resembles the *Cheltenham* water.

H A T H L O N E,

ATHLONE,

In the County of Roscommon, Ireland.

It is a chalybeate water, without colour or smell, but it will not keep.

It operates by urine, and is gently laxative. It seems to resemble the *Hartlepool* water.

AYLESHAM,

In the County of Norfolk.

It is a light chalybeate water, similar to that of *Islington*.

BADEN,

In Austria, Germany.

The waters are warm and sulphureous, and have been recommended in those disorders in which the *Bareges* and *Aix-la-Chapelle* waters have been found serviceable. They are particularly spoken of for the cure of gun-shot wounds, and the complaints which remain after them.

BADEN

BADEN BADEN,

In Swabia, Germany.

There are a number of hot sulphureous springs and baths in and near this place, which have the same general virtues as those of *Aix-la-Chapelle* and *Bareges*. Taken inwardly they are also gently laxative.

BAGNIGGE WELLS

PURGING WATER.

It is situated on the north-east side of London, near Islington, and is much frequented in the spring.

It is a salt purging water.

Its virtues are similar to those of *Pancras* and *Acton*.

The dose is from a pint to a quart. But it is usually quickened with *Glauber's*, or other salts.

The CHALYBEATE WATER.

It is clear when it comes from the pump, and has a slight irony taste.

When first taken to the quantity of three or four glasses, it is usually purgative. But this effect does not continue after the intestines are cleared of their vitiated contents.

In its virtues it resembles the *Orston* and other similar chalybeates.

B A L E M O R E.

See *Ilmington*.

B A L L, or B A N D - W E L L,

In Lincolnshire.

It resembles the *Dropping-Well* water. Four or five half pints are reckoned a sufficient dose.

B A L A R U C,

In Languedoc, France.

The waters of this place are hot, and gently purgative. They have been used in
many

many disorders for which salt purging waters are prescribed.

As they are hot, they have also been found particularly useful in cases where warm baths are proper, to assist the operation of such waters.

Hence they have been found particularly useful in palsies and rheumatisms, in scrophulous, and many other disorders.

BALLYCASTLE,

In the County of Antrim, Ireland.

It is a chalybeate water, somewhat of the nature of those of *Islington* and *Hampstead*; only it has a foetid smell.

BALLYNAHINCH,

In the County of Down, Ireland.

It is a very clear, cold, chalybeate and sulphureous water, and is good in scorbutic and cutaneous diseases, in loss of appetite, &c.

BALLYSPELLAN,

Eight Miles from Kilkenny, in Ireland.

It is a light chalybeate water, similar to those of *Islington*, and *Hampstead*.

BAGNIERS,

In the Bigorre, France.

At this place are a variety of warm baths, which are used in the same disorders as those of *Aix-la-Chapelle*.

The waters of some springs taken internally are diuretic, and others purgative.

BAREGES.

In the Bigorre, France.

There are several springs of hot sulphureous water at this place, which form four baths.*

The water is at first clear ; but by standing throws up a thin pellicle, resembling a
fine

* Dr. Simmons informs me, that on plunging his thermometer into the hottest spring the mercury rose to 112°.

fine light oil. It has a slight sulphureous smell, like that of eggs boiled hard. It has a soft and somewhat nauseous taste, and feels soft, like soap-water, or oil. Its volatile parts fly off on exposure to the air; and it is best drank at the fountain head.

This water operates by perspiration, and by urine; but seldom by stool. The dose is usually a quart, or three pints.

It is also used as a bath; as a fomentation; and as a douche.

The Barages waters have been recommended in a variety of disorders; in rheumatisms, palsies, convulsions, cutaneous eruptions, the gout, scurvy, &c. Also in wounds, ulcers, hard tumours; and they are said to have been efficacious in old gunshot wounds, and in hard knots in the urethra after venereal complaints.

BARNET AND NORTH-HALL.

The *former* spring is situated at East Barnet in Hertfordshire.

The *latter* lies about three miles north of High Barnet.

They are both purging waters, somewhat of the nature of *Epsom* water, but much weaker. That of *Barnet* is the strongest of the two.

B A R R O W D A L E.

The Spring is about three Miles from Kewick in Cumberland.

It is a salt water, and much of the nature of that of the sea, but stronger.

It is a brisk and rough purge even to strong constitutions, occasioning great thirst, and heating the body. A pint is usually sufficient for a dose.

Taken in less quantity (half, or a quarter of a pint) it operates by urine.

It is of excellent use in scorbutic complaints, in the King's evil, and the leprosy. It is also powerful in removing chronic obstructions; in clearing the blood
of

of acrimonious humours; in diseases in the skin; and in all those complaints in which sea water is serviceable. Like that also it may be used externally by way of fomentation or bath. See *Sea Water*.

B A T H,

In Somersetshire.

This place has long been famous for its warm chalybeate waters. There are several springs; but their waters are all of the same nature. There are six baths, but the principal are the *King's* bath, the *Queen's* bath, and the *Cross* bath. The others are only appendages to these. They are not equally hot.

The water when viewed in the baths has a greenish, or sea colour: but in a vial it appears quite transparent and colourless, and it sparkles in the glass.

It has a very slight saline, bitterish, and chalybeate taste, which is not disagreeable, and sometimes somewhat of a sulphureous smell; but this latter is not usually perceivable,

ceivable, except when the baths are filling.

As it rises from the pump, it contains fixed air, or other volatile acid, in a sufficient quantity to curdle milk and dissolve iron. It is also slightly impregnated with sea salt.

The Bath water operates powerfully by urine, and promotes perspiration. If drank quickly, in large draughts, it sometimes purges; but if taken slowly and in small quantity, it rather has the contrary effect. An heaviness of the head, and inclination to sleep, are often felt on first drinking it.

This water when taken inwardly gives a brisk stimulus to the nerves and fibres, and seems to give new life and vigour to the whole frame. It also powerfully corrects putrescent acrimony. Hence when taken into the stomach it is said to dilute and blunt whatever putrescent humours it meets with; while its brisk, volatile chalybeate principles stimulate and increase the tone of the stomach and bowels, and brace
up

up their fibres and nerves. Entering the circulation, they pervade the minutest vessels; dilute, blunt, and correct those fluids in the blood which are too putrescent; encrease the action of the whole vascular system to promote the circulation through the smallest vessels; to break down gross humours; to remove obstructions; and to promote secretions of the skin and kidneys; for carrying off those fluids that are unfit to circulate longer in the general mass. And hence it is that they have been found so serviceable in such a variety of disorders. In female complaints, for example; such as obstructions of the menses; barrenness proceeding from obstruction and relaxation of the womb; the fluor albus, &c. In hysteric and hypochondriacal disorders; in complaints of the stomach and bowels proceeding from weakness and laxity, or from putrescent humours. In pains of the stomach, attended with bad digestion, and in many cholicky and other disorders of the stomach and bowels. In disorders of the head and nerves; such as palsies, epilepsies, convulsions, &c. In diseases of the skin; the sea scurvy; leprosy. In obstructions of the
liver,

liver, spleen, and other bowels ; in gouty and rheumatic complaints ; in the stone and gravel ; and in many other diseases.

These waters being of an heating nature, it is usual, previous to a course of them, to cool the body by gentle purges, by a low diet, and, if found necessary, by bleeding.

They may be drank from half a pint, to two, three, or four pints in a day, according to circumstances. The best method is to take one, two, three, or four half glasses at proper intervals in the morning ; a glass or two an hour before dinner ; and as much about the same time before supper. The patient in the mean time should live upon a light diet, easy of digestion ; to use proper exercise ; to go early to bed ; and rise betimes in the morning.

In some cases, however, these waters are hurtful. In hectic fevers, for example ; in suppurations of the lungs ; in fits of the gout ; and in the rheumatism if inflammatory ; and indeed in all cases of inflammation ; as also where the action of the fibres is already

ready too strong, the animal heat too great, and the blood thick and fizy.

The quantity of the waters drank in a day should be gradually encreased to as much as the patient can bear; and after continuing that quantity a sufficient time, it should be as regularly diminished. The course may be continued for a month or six weeks.

The usual season for the Bath waters is in April, May, and June; and in August, September and October.

These waters are also used externally in a variety of disorders, and with good effect; and that either by bathing or pumping, as occasion may require, especially if used inwardly at the same time. Forests of crutches left there, are an ample testimony of the efficacy of bathing in paralytic cases. By softening and relaxing the parts, and at the same time giving a gentle stimulus, they are also of service in removing many inveterate gouty and rheumatic complaints. In diseases of the limbs, &c. arising from obstructions; in sprained, relaxed, and stiff joints; in
scorbutic

scorbutic and cutaneous diseases, old sores and ulcers, and in many other cases; and when the complaint is local, pumping is generally preferred to bathing.

It is a certain effect of these and other baths, to throw out a redness and kind of eruption on the skin, especially in those who are scorbutic, &c. But this effect disappears by their continued use, and the disorders themselves are at length cured.

The mud and scum of these waters have also been applied with good effect by way of poultice in hard swellings, in weak joints, in contractions of the limbs, in scald heads, running ulcers, &c. and herbs are sometimes boiled with them in the Bath water to a proper consistence, for these and the like purposes.

B I L T O N,

Near Knaresborough, in Yorkshire.

The water has a strong sulphureous smell, and tastes somewhat saltish. It is colder than common water.

It

It contains the native alkaline salt, with a little sea salt.

It acts as a gentle purge; and is somewhat similar in virtue to the *Sutton Bog* water.

B I N L E Y,

Near Coventry, in Warwickshire.

It is a chalybeate water, and also purgative and diuretic. It resembles the *Scarborough* water, but is less purgative.

B I R M I N G H A M,

In Warwickshire.

Near to this place is a brisk chalybeate water, which seems to resemble that of *Hampstead* in *Middlesex*.

B O R S E T. †

*About a Mile and half from Aix-la-Chapelle,
Germany.*

The waters are warm, and of the nature
of

† The waters at this place, which is only about a mile from *Aix-la-Chapelle*, are distinguished into the upper
and

of those of Aix-la-Chapelle; but they are only used as baths, for the diseases in which the waters last mentioned are recommended, and also in dropfical and oedematous cases.

B R A B A C H,

In the District of Mengerskirchen, in the Country of Nassau, Germany.

It is a brisk spirity chalybeate water, which may be preserved long in well-stopt bottles, though it soon spoils in the open air. It has a somewhat salt, sulphureous, and astringent taste, and contains the fossil alkali.

It resembles the German *Spa Water* in its general virtues.

BRAN-

and lower springs. The former were found by Dr. Simmons to raise the thermometer to 158° ; the latter to only 127° . All the baths are supplied by the first. Dr. Simmons observed that these waters were much less sulphureous than those of Aix-la-Chapelle, probably on account of their greater heat. He likewise found that they abounded much with selenitis, which incrust the pipe through which the water passes, and likewise the sides of the bath.

BRANDOLA,

In Italy.

It is a slight chalybeate water, extremely limpid and chrystalline, impregnated with an alkaline salt, and abounding in fixed air. It smells somewhat sulphureous, and has an acidulous taste.

It is commonly drank from two pints to a gallon or more in a day. It promotes urine and perspiration, and is gently laxative.

Its virtues seem to resemble those of the *Islington* and *German Spaw* waters.

BRENTWOOD,

In Essex.

It is a purging water, of the nature of those of *Pancras*, *Epsom*, and *Dulwich*.

BRISTOL,

In Somersetshire.

The springs are known by the name of the *Hot Wells*,

The water at its origin is warm, clear, pellucid and sparkling; and if let stand in a glass, covers its inside with small air-bubbles. It has no smell, and is soft and agreeable to the taste. It raises the thermometer from about seventy to eighty degrees. It contains an earthy matter, which is suspended by means of fixed air, together with sea salt, and a species of Glauber's salt. The quantities of these latter ingredients however are very small.

It has been recommended in a variety of disorders. In consumptions and weakness of the lungs; in cases attended with hectic fever and heat (in which, among other properties, they differ from the *Bath* water) in uterine and other internal hæmorrhages, and in immoderate discharge of the menses; in old diarrhæas and dysenteries; in the fluor albus; in gleets; in the diabetes; and in other cases where the secretions are too much increased, and the humours too thin; in the stone and gravel; in the stranguery; in colliquative sweats; in scorbutic and similar cases; in cholics; in the gout and

and rheumatism ; in loss of appetite and indigestion ; and in many other diseases.

The usual method of drinking the water is a glass or two before breakfast, and about five in the afternoon. The next day three glasses before breakfast, and as many in the afternoon ; and this is to be continued during the patient's stay at the Wells. A quarter or half an hour is allowed between each glass.

A course of these waters requires no preparation further than to empty the bowels by some gentle purge ; and if heat or fever requires, to take away a few ounces of blood. Costiveness, however, should be avoided during the course.

Externally they are useful in sore and inflamed eyes ; in scrophulous and cancerous ulcers ; and in other similar cases.

This water is cooling and quenches the thirst. It is best drank at the spring head ; though it will bear carriage tolerably well.

B R O M L E Y,

In Kent.

It is a chalybeate water, resembling those of *Spaw, Islington, and Hampstead.*

B R O U G H T O N,

*In the West Riding of Yorkshire, near Coln,
in Lancashire.*

It is a strong sulphureous water; it turns silver and copper black; it reddens the leaves of trees, &c. and makes the bottom of its basin black.

It is impregnated with sea salt, and a purging salt; and its virtues are similar to those of the *Harrowgate* water.

B U C H,

*Situated about a German Mile from the
Caroline baths in Bohemia.*

The waters have a brisk pungent taste, and are plentifully impregnated with *fixed air*. This, on exposure, flies off, and they become insipid. In this they differ from
Seltzer

Seltzer water, which acquires a lixivial taste by standing.

They contain, however, an alkaline salt; and therefore their virtues are similar to those of the *Tilbury* and *Seltzer* waters, but much weaker.

BUGLAWTON,

Near Congleton, in Cheshire.

It is a sulphureous water, impregnated with a purging salt, and in its virtues seems to resemble the *Askeron* water.

It is intensely cold, and has a pretty strong sulphureous smell and taste.

BURLINGTON,

In Yorkshire.

It is a brisk chalybeate water, and resembles those of *Scarborough* and *Cheltenham*, tho' it seems to be less purgative.

BOURNLEY, or BURNLEY,

In Lancashire.

It is a chalybeate water of the nature of the *Scarborough*, but less purgative.

B U X T O N,

In Derbyshire.

This is a hot water, resembling that of *Bristol*.

It has a sweet and pleasant taste.

It contains the calcareous earth, together with a small quantity of sea salt, and an inconsiderable portion of a purging salt. But no iron can be discovered in it.

This water taken inwardly is esteemed good in the diabetes; in bloody urine; in the bilious cholic; in loss of appetite, and coldness of the stomach; in inward bleedings; in atrophy; in contraction of the vessels and limbs, especially from age; in cramps and convulsions; in the dry asthma without a fever; and also in barrenness.

Inwardly and outwardly it is said to be good in rheumatic and scorbutic complaints; in the gout; in inflammation of the liver and kidneys, and in consumptions of the lungs; also in old strains; in hard callous tumours; in withered and contracted limbs;
in

in the itch, scabs, nodes, chalky swellings, ring worms, and other similar complaints.

Besides the hot water, there is also a cold *chalybeate* water, with a rough irony taste. It resembles the *Cawthorp* water.

C A N N O C K.

Near Stafford.

It is one of the best and lightest *chalybeate* waters in Staffordshire. In its virtues it resembles those of *Hampstead* and *Islington*.

C A P E C L E A R.

Situated in the most southern part of Ireland.

It is a smooth, saltish water, and lathers with soap.

It contains an alkaline salt, together with a little sea salt.

Its virtues are similar to those of the waters of *Tilbury* and *Clifton*, but weaker.

C A R G Y R L E,

In Wales.

The spring is situated about ten or twelve miles from Chester.

The water is of the nature of the *Barrowdale* water, but much weaker, several quarts being required to be taken for a purge.

C A R O L I N E B A T H S,

At Carlsbad, in Bohemia, Germany.

The waters of this place are hot, and are impregnated with the fossil alkali.

They are recommended externally and internally in female obstructions. In relaxed habits. In glandulous obstructions. In disorders arising from viscid fluids, and in a variety of other complaints; and it is said, that they may be drank, and bathed in, by persons of all ages and constitutions, with safety.

CARLTON,

C A R L T O N,

Near Newark upon Trent, in the county of Nottingham.

It is chalybeate water, resembling those of *Islington* and *Hampstead*, but it has a foetid smell, like infusion of horse-dung.

C A R R I C K F E R G U S,

In the county of Antrim, Ireland.

The water is of a bluish colour, and a very soft taste at the fountain head.

It is weakly purgative; and must be drank to the quantity of two or three quarts.

C A R R I C K M O R E,

In Ireland.

It is situated about five miles from Bel-turbet, in the county of Cavan.

The water has a soft, milky taste, like Bristol water; and putrifies by keeping.

It

It curdles a solution of soap; and with salt of tartar gives a white sediment.

It contains an alkaline salt, together with a purging salt.

Its virtues therefore are similar to those of *Tilbury* and *Clifton*.

C A R S T A R P H I N.

Two miles from Edinburgh, Scotland.

It is a weak sulphureous water, slightly impregnated with sea salt.

There is another spring, about a mile from Edinburgh, on the banks of the water of Leith.

They resemble the *Moffat* water in virtues; and the latter is reckoned the strongest.

C A S H M O R E.

In the County of Waterford, Ireland.

It is near the *Cross-town* water, which it resembles in virtues, though stronger.

CASTLE-

C A S T L E C O N N E L,

In the County of Limerick, Ireland.

It is a chalybeate water of considerable repute, and resembles the German *Spaw* waters.

C A S T L E M A I G N,

In the county of Kerry, Ireland.

It is a sulphureous, and strongly chalybeate water, and in its virtues seems to resemble that of *Deddington*.

C A W L E Y,

Near Dranefield, in Derbyshire,

It is sulphureous, and gently purgative; and resembles the *Askeron* water.

C A W T H O R P,

Four miles from Bourne, in Lincolnshire.

It is a saltish chalybeate water, and foams much as it rises from the spring.

It resembles the *Tunbridge* water in virtues, but is said to be more purgative; and is also a good corrector of acidities.

CHAD-

CHADLINGTON,

Near Chipping-Norton, Oxfordshire.

The water has a saltish taste, and smells like the washings of a foul gun.

It is one of the waters termed sulphureous.

It contains also the fossil alkaline salt, together with a little sea salt.

It acts as a purgative; and its virtues resemble those of the *Sutton Bog* water.

CHAUDE FONTAINE.

About two leagues from Liege, and three from Spaw, in Germany.

The water of these springs is hot, and supplies fifty baths.

It is classed by authors with the sulphureous waters; but Dr. Simmons, † who spent some time at this place in 1776 and 1777, informs me they have no sulphureous smell;

† The same gentleman informs me, that on the 5th of July 1777, when the mercury in his thermometer, in the shade, stood at 75°, it rose in the bath to 92°.

smell; that they are impregnated with calcareous earth, and fossil alkali, and also with fixed air.

They are not chalybeate; and therefore rather resemble our *Bristol* and *Buxton* than the *Bath* water.

Their virtues *externally* however may be collected from what has been said of the *Aix-la-Chapelle* and *Bath* waters.

CHEL TEN HAM.

In Gloucestershire, six miles from Gloucester.

It is one of the best and most noted purging chalybeate waters in England, tho' it is not so much frequented as formerly.

The dose is from one pint to three or four. It operates with great ease, and is never attended with gripings, tenesmus, or straining at stool. It is best taken a little warm.

It also creates an appetite; is excellent in scorbutic complaints, and has been used with success in the gravel.

CHIPPEN-

CHIPPENHAM,

In Wiltshire.

It is a pretty strong chalybeate water, resembling those of *Islington* and *Tunbridge*.

CLEVES,

In the Duchy of Cleves, Germany.

It is a brisk chalybeate water, and operates by urine. It resembles the *Pyrmont* water.

CLIFTON,

This is a Village near Deddington in Oxfordshire.

The well is about a furlong south of Clifton. The water is clear, and has but little taste.

The principal ingredient contained in it is the fossil alkali.

Its virtues are similar to those of the *Tilbury* water, though in a less degree. But as it also contains a purging salt, it is more purgative than that.

It

It has been much used by way of bath in disorders of the skin.

C O B H A M,

In the County of Surry.

It is a chalybeate water, of the nature of that of *Tunbridge*, but rather stronger of the iron.

C O D S A L W O O D,

Five Miles from Wolverhampton, Staffordshire.

It is a strong sulphureous water.

In its virtues it seems to resemble the *Askeron* water.

C O L C H E S T E R,

In the County of Essex.

It is a purging water of the nature of those of *Acton* and *Epsom*.

C O L U R I A N,

In the Parish of Ludgvan, in Cornwall.

It is a chalybeate water, and seems to resemble those of *Hampstead* and *Islington*.

COM-

COMNER, or CUMNER,

In Berkshire, four miles west of Oxford.

The water is of a whitish colour, especially in the summer.

It is purgative, and may be drank to the quantity of one, two, or three quarts, according to the patient's constitution.

COLLAURAN,

In the county of Fermanagh, Ireland.

It is a chalybeate water, resembling that of *Peterhead*, but weaker.

COVENTRY,

In Warwickshire.

It is a chalybeate and purging water, which sits easy upon the stomach, soon passes off, raises the spirits, and creates an appetite.

In its general virtues it resembles the *Scarborough* and *Cheltenham* waters.

CRICKLE SPAW,

Situated near Broughton, in Lancashire.

It is a strong sulphureous water, impregnated with sea salt.

It

It is purgative; and in its virtues resembles the *Harrogate* water.

C R O F T,

In the North Riding of Yorkshire, on the confines of Durham.

This is a strong sulphureous water, weakly impregnated with a purging salt.

It is clear and sparkling, and its stream does not rise or fall by rain or drought.

It is purgative, and of the nature of the *Askeron* water; and is said to have performed remarkable cures.

C R O S S - T O W N,

Near the Town of Waterford, Ireland.

It resembles the *Hartfell* water in Scotland.

This water vomits some, purges others, and with others operates by urine.

It seems at some times to contain a greater quantity of acid than at others.

CUNLEY HOUSE,

Near Whaley, in Lancashire.

It is strongly sulphureous, and gently purgative, and seems to resemble in its virtues the *Askeron* water.

DAS WILD-BAD,

*Within the Walls of the Town of Nuremberg,
Germany.*

It is a chalybeate water, with a sub-astringent taste, and contains also a saline matter.

It has been recommended in obstructions of the viscera, and in female complaints.

D'AX EN FOIX,

*About fifteen leagues west of Thoulouse,
France.*

This place abounds with hot sulphureous waters of different temperatures. They are recommended as baths, or otherwise, in those complaints in which the *Aix-la-Chapelle* and *Bareges* waters are serviceable.

DED.

DEDDINGTON,

This is a sulphureous chalybeate water; but soon loses its sulphureous smell by keeping.

Drank in large quantities it is purgative; and in less doses as an alterative, it is good in scorbutic and cutaneous disorders.

DERBY,

Near to the Town of Derby, in Derbyshire.

It is a chalybeate water of the nature of that of Tunbridge, but seems to be stronger.

DERRINDAFF,

In the County of Cavan, Ireland.

This is a sulphureous water, impregnated with a purging salt.

Its virtues resemble those of the *Askeron* water.

DERRYHENCE, or DERRYINCH.

In the County of Fermanagh, Ireland.

The water is sulphureous.

It contains also the fossil alkali, and resembles in its virtues the waters of *Drumgoon* and *Swadlingbar*.

D E R R Y L E S T E R,

*In the County of Cavan, about three Miles
from Swadlingbar, Ireland.*

The water is of the nature of that of
Swadlingbar, but stronger.

D O G A N D D U C K;

A noted tea-drinking house in St.
George's Fields, near London; and in the
spring and summer months the waters are
much resorted to.

The water is clear, and has but little
taste.

It is a mild purgative, and may be drank
to the quantity of several pints. Most fre-
quently, however, it is quickened by the
addition of Glauber's, or other purging
salts.

It is of use in scrophulous complaints,
leprosy and diseases of the skin; and is
also said to prevent the return of cancerous
diseases. For these complaints it may be
used both internally and externally.

It

It is cooling and diuretic; and may be given freely to young people of robust constitutions. But it cools and relaxes people in years and of weak habits too much. It is also apt to bring on or encrease the fluor albus in weakly women.

DORTSHILL,

Near Litchfield, in Staffordshire.

The water is a brisk chalybeate, similar to that of *Tunbridge*.

There is also a saline purging water of the nature of the *Barrowdale* water, but weaker.

DRIG WELL,

Near Revenglas, in Cumberland.

This is a brisk, spirituous, sulphureous chalybeate; and in its virtues resembles the *Deddington* water.

DROPPING WELL,

At Knaresborough, in Yorkshire.

It is very cold, limpid, and sweet tasted;

and in time petrifies substances thrown into it.

In its virtues it resembles the *Newton Dale* water. The dose has formerly been several quarts in the day; but three or four half pints are now judged sufficient.

Its use should be preceded by a dose or two of rhubarb.

DRUMASNAVE,

Called likewise Mount Campbell, in the County of Leitrim, Ireland.

This is one of the strongest sulphureous waters in Ireland, as is shewn by its quick and strong effect in discolouring metals.

It is perfectly clear and limpid in common; but before rain becomes white.

It contains the fossil alkali, with a small quantity of purging salt.

It operates powerfully by urine, and purges some constitutions, but is said to render others costive.

DRUM-

DRUMGOON,

In the County of Fermanagh, Ireland.

The water has a strong sulphureous smell, and tinges silver of a copper colour in a few minutes. It also deposits a black sediment at the bottom of the well.

It contains the fossil alkali, with a little sea salt.

It is recommended for the cure of cutaneous and scrophulous disorders; and for worms.

There are two other sulphureous springs in the neighbourhood; the one nearly resembles this; the other is more of a purgative nature.

DUBLIN SALT SPRINGS.

There are five of those Springs in Francis Street, and one in Thomas's Court.

The waters are salt, and of the nature of *Barrowdale* water. For a purge, they must be taken to the quantity of several pints. They operate without griping.

D U L W I C H,

The Spring is situated between Dulwich and Lewisham, in the County of Kent.

The water is clear, and has a brackish taste, leaving a bitterness in the throat.

It contains a purging salt, together with sea salt.

This is a celebrated purging water; is also diuretic; and is recommended in a variety of disorders.

It is particularly of use in complaints arising from obstructions; as those of the liver, spleen, and other viscera,

It is recommended in the green sickness, the jaundice, the scurvy, in difficulty of urine, and in gravelly complaints,

It is said to strengthen the stomach, and create a good digestion.

It is also said to strengthen the nervous system, and therefore to be serviceable in palsies, apoplexies, and other nervous disorders.

orders. In these cases it is best taken warm.

The course of drinking this water is usually twenty days. Three pints a day are to be drank at first; it should be encreased to eight pints by the tenth day, and afterwards decreased in the same manner.

A new spring has since been discovered; whose virtues are similar to those of the old one, but it is stronger.

D U N N A R D,

About eighteen miles from Dublin.

This is a chalybeate water, resembling that of *Peterhead*, but weaker.

D U N S E,

In Scotland.

It is a chalybeate water, similar to that of *Tunbridge*.

DUR-

D U R H A M.

The spring is situated near Durham, on the north side of the river Ware.

It is a strong sulphureous water, and is also impregnated with sea salt.

In its virtues it resembles the *Harrogate* water.

Near to this, in the middle of the river, is a salt spring, which is drank as a purging water.

E G R A,

In Bohemia.

This is a spirity chalybeate water, and operates both by stool and urine. It contains less fixed air than the *Pyrmont* water, but is more purgative, and seems rather to resemble our *Scarborough* and *Cheltenham* waters.

E P S O M,

In Surry, about sixteen miles from London.

The water has a slight saline taste, is clear, and without smell. But if it be kept in

in covered vessels for some weeks in the summer it will stink, and acquire a nauseous and saltish bitter taste.

This was the first water from which the bitter purging salt (thence called *Epsom salt*) was obtained. But the salt usually sold by that name is different from that yielded by the Epsom water, though perhaps not inferior in virtue. It is made from the bittern left after the chrySTALLIZATION of common salt from sea water.

The Epsom water is purgative; for which purpose it must be drank to the quantity of two or three pints. It also operates by urine.

Taken in less quantity (about the third part of a pint three times a day) it is a mild alterative, and good in those complaints for which the *Acton* and *Pancras* waters are recommended.

It is likewise esteemed good for washing old sores.

FELSTEAD,

In Essex.

The spring is situated at the bottom of a rock. The water is a light chalybeate, resembling that of *Islington*.

FILAH,

Near Scarborough, in Yorkshire.

This is a salt chalybeate water, and is used by the common people as a purgative; for which purpose they drink to the quantity of several quarts; it also operates by urine.

FRANKFORT,

In Germany.

There are two strong sulphureous waters in the neighbourhood of Frankfort on the *Maine*.

The one is called FAULPUMP,

The other FONS SCABIOSORUM.

They are also impregnated with sea salt,
and

and are of the nature of the *Moffat* and *Harrogate* waters.

G A I N S B O R O U G H,

In Lincolnshire.

This is a weak sulphureous chalybeate water, similar to that of *Deddington*.

G A L W A Y,

In the county of Galway, Ireland.

It is a chalybeate water, of the nature of that of *Tunbridge*.

G L A N M I L E,

Near Naul, in Ireland.

It is a chalybeate water, resembling that of *Peterhead*, but weaker.

G L A S T O N B U R Y,

In Somersetshire.

This water is of the same nature with those of *Tilbury* and *Clifton*; but weaker than either of these.

It has also a small mixture of sea salt.

It

It is naturally sweet, but by keeping becomes putrid.

This water was formerly in great repute; and many superstitions were held concerning it; but it has not lately been esteemed.

Its virtues may be collected from what is said of *Tilbury water*.

G L E N D Y,

In the County of Mairns, Scotland.

This is a strong chalybeate water, little inferior to that of *Peterhead*.

G R A N S H A W,

Near Dunnaghadee, in the County of Down, Ireland.

It is a chalybeate water, of the nature of that of *Castle Connel*.

G U G G A,

See *Kuka*.

H A I G H,

H A I G H,

Near Wigan, in Lancashire.

It is impregnated with green vitriol;
and is of the nature of the *Shadwell* water;
which see.

It works plentifully by vomit, and stool;
and is excellent for stopping inward bleeding.

H A M P S T E A D,

This is a chalybeate water, of the nature
of that of *Islington*, but somewhat stronger.
The dose is from half a pint to several pints.

It was formerly, and perhaps deservedly,
in great repute.

This water is better in the morning than
in the middle of the day; and in cold wea-
ther it is much stronger than in hot.

H A N B R I D G E,

In Lancashire.

It is a chalybeate water, of the nature of
that of *Scarborough*, but less purgative.

H A N-

H A N L Y S,

Near Shrewsbury, in Shropshire.

The water is clear, and limpid, and has a saline and bitter, though not disagreeable taste.

It springs up with impetuosity at the fountain; and does not change colour, or lose its virtue, by being exposed to the air.

It is purgative; and the dose is from two to four half pints.

At this place there is also a *chalybeate water*. It is near to the purging water, and is of the nature of those of *Scarborough* and *Landrindod*.

It is brisk and pungent to the taste, and as it is taken from the fountain, clear, and not unpleasant; but loses its virtues by keeping.

H A R R O G A T E,

Near Knaresborough, Yorkshire.

There are four springs at this place, but the waters of all of them are nearly alike.

The

The water as it springs up is clear and sparkling, and throws up a quantity of air bubbles.

It has a strong smell of sulphur, and is supposed to be the strongest sulphureous water in England.

It has a salt taste, as it contains a considerable quantity of sea salt, together with a little purging salt.

It is purgative; and the dose required for this purpose is about three or four pints.

When drank in smaller quantities, it is a good alterative, and is found serviceable in the scurvy, king's evil, and diseases of the skin. It may be used at the same time outwardly, by way of bath, or fomentation.

It has been found efficacious in destroying worms.

It has been recommended in the gout, jaundice, the spleen, the green sickness, and other disorders arising from obstructions.

It is used externally for removing old aches, strains, paralytic weakneses, and the like. Also for the cure of ulcers, scabs, the itch, &c.

N. B. Between *Harrogate* and *Knarestorough*, are also several *chalybeate* waters, which seem to resemble those of *Hampstead* and *Islington*. The most remarkable are, *the Allum Well*, *the Sweet Spaw*, and *the Tuewhet Well*. The latter is the strongest.

H A R T F E L L,

In the county of Annandale, Scotland.

It is impregnated with green vitriol, and resembles the *Shadwell* water.

It is recommended in inward bleedings, in immoderate flux of the menses, in dysenteries, in bloody urine, in the fluor albus, in gleans, in complaints of the stomach and bowels, and in consumptions.

The dose is from a gill to a pint or two, taken at repeated draughts in the morning.

Exter-

Externally, it cures itchy, and tetterous eruptions, and old sores, especially if taken at the same time as an internal remedy.

H A R T L E P O O L,

In Durham.

This is a fine clear chalybeate water; with a slight sulphureous smell, and pleasant taste.

It is also diuretic and laxative; and is recommended as excellent in scorbutic complaints, in bilious and nervous cholics, in pains of the stomach and indigestion, in the gravel, in female obstructions, in the hypochondriacal disease, in cachexy, in hectic heats, and in recent ulcers.

H O L T,

Near Bradford, in Wiltshire.

The water is limpid, and has but little taste.

It contains a purging salt, together with a large quantity of earth.

On account of the latter ingredient, it is but a very mild purge, and two quarts are usually required to produce any considerable operation this way.

Taken in less quantity it is alterative, and diuretic.

It is also good as a diluent, cooler, and strengthener; and creates an appetite.

Externally, rags, or sponge dipt in it, are said to cure scrophulous ulcers, attended with carious bones; an internal course being observed at the same time.

It is also of service in old running ulcers of the legs, and other parts; in cutaneous foulnesses, though attended with hot corrosive humours; in the piles, in cancerous ulcers, and in sorenesses of the eyes. But in these cases also it must be used both internally and externally.

H O L T,

See *Nevil-Holt*.

J E S-

JESSOP'S WELL,

On Stoke Common, near Cobham, in Surry,

This is a strong purging water, with a nauseous taste, and is also slightly chalybeate.

Drank to about a quart, it purges briskly without griping, and operates likewise by urine.

It also enlivens the spirits, and as the dose is smaller than that of other purging waters, it sits better on the stomach.

It loses its virtues by being kept.

Taken in less doses as an alterative, it is a good antiscorbutic.

ILMINGTON,

In Warwickshire, on the borders of Worcestershire.

This is a very clear and sparkling chalybeate water, abounding in fixed air, and impregnated also with the fossil alkali.

It preserves its virtues for several weeks in bottles well corked; though if exposed to the air, it loses them in twenty-four hours.

It operates by urine; though it also sometimes purges.

It is recommended as excellent in scorbutic complaints, in obstructions of the liver and spleen, in the jaundice, in beginning dropsies, in the gravel, and obstruction of urine, and in disorders arising from acidity.

Externally, it is good for old running sores, scorbutic eruptions, and the like.

I N G L E W H I T E,

In Lancashire.

It is a strong chalybeate sulphureous water, and is good in scorbutic, and cutaneous diseases. But it will not purge unless Glauber's, or other salt be added to it.

I S L I N G T O N,

In the county of Middlesex, near London.

This is a light chalybeate water, striking a purple or blackish colour with galls, and is reckoned

reckoned one of the best of the kind about London.

The iron in this water is held in solution by means of *fixed air*, or *aërial acid*, as in the Pyrmont water. If after the fixed air has escaped, and the iron (which it held in solution) precipitates, the water be left to putrify, the fixed air disengaged by the putrefaction again dissolves the iron, and causes it to be suspended in the water; it then recovers its chalybeate taste, and property of tinging with galls, both which it had lost before.

It is recommended in indigestion, and loss of appetite, in lowness of spirits, nervous, hysteric, and hypochondriacal complaints, and relaxed constitutions, and raises the spirits greatly. It is good in the fluor albus, in weaknesses from miscarriage, in obstructions of the liver, the kidneys, &c. It is also serviceable in diseases of the skin, in scorbutic complaints, in the gravel, and in paralytic disorders.

It operates chiefly by urine, and may be drank to the quantity of several half pints, or

even pints, according to the patient's constitution.

This water was formerly in great repute, and deserves to be more frequented than it is at present.

K A N T U R K,

In the county of Cork, Ireland.

It is a chalybeate water, of the nature of that of *Peterhead*, but weaker.

K E D D L E S T O N E,

In Derbyshire.

This is a strong sulphureous water, and stinks intolerably.

It is extremely clear at the fountain, but by standing becomes blackish. It presently turns silver of a black copper colour.

It is impregnated with sea salt.

Its virtues resemble those of the *Harrogate* water.

K E N-

K E N S I N G T O N,

In the county of Middlesex, near London.

It is a purging water, of the nature of those of *Acton* and *Pancras*.

K I L B R E W,

In the county of Meath, Ireland.

This is a strong vitriolic chalybeate water, and resembles the *Shadwell* water.

Half a pint vomits and purges.

When taken as an alterative it should be used with great caution, beginning with a small quantity, and increasing the dose.

It is recommended in the fluor albus, in immoderate fluxes from the womb, in obstinate intermittents and in dropfies.

K I L B U R N,

In Middlesex, near London.

It is a purging water, like those of *Bag-nigge Wells*, *Dulwich*, &c.

K I L-

K I L R O O T,

In the county of Antrim, Ireland.

It is of the nature of *Barrowdale* water, but weaker; several pints being required for a purge.

K I L L I N G S H A N V A L L Y,

In the county of Fermanagh, Ireland,

This is a chalybeate water, and is also diuretic and gently laxative. It seems to resemble the *Hanlys* chalybeate water.

K I L L A S H E R,

In the county of Fermanagh, Ireland.

The water is strongly sulphureous, and it contains the fossil alkali.

Its virtues resemble those of the *Swadlingbar* water.

K I N A L T O N, or K Y N O L T O N,

A village in Nottinghamshire.

The water is limpid and cooling, with a somewhat saltish taste.

It

It is purging; but is weaker than the Epfom water, and therefore must be drank plentifully.

KINCARDINE,

In the county of Mairns, Scotland.

This is a chalybeate water, little inferior in strength to that of *Peterhead*.

KINGSCLIFF,

In Northamptonshire.

It is a chalybeate laxative water, and resembles the *Scarborough* and *Cheltenham* waters.

KIRBY, or KIRKBY-TOWER,

In Westmoreland.

There are two springs nearly of the same kind, only the lower one is reckoned the strongest chalybeate.

The water of both is clear, fine, and has a chalybeate sweetish taste. Drank to the
quantity

quantity of several quarts it is purgative.
It is also a good corrector of acidities.

KNARESBOROUGH,

See Dropping Well.

KNOWSLEY,

In Lancashire.

This is a light spirituous chalybeate water,
and both tastes and smells of iron.

If drank to four or five pints it is laxative.

It resembles the *Scarborough* and *Cheltenham* waters in virtue, though it seems to be less purgative.

KORYTNA,

Near Hunnobra, in Moravia, Germany.

It is situated on an high and almost inaccessible rock, in the midst of a thick wood.

It has a very foetid disagreeable taste, and a black colour; and there is much mud at the bottom of the well.

It

It is reckoned the strongest sulphureous water in that country.

K U K A,

In the county of Graditz, in Bohemia, near the town of Jaromitz, at the conflux of the rivers Elbe and Orlitz, Germany.

This is a very brisk chalybeate water, highly impregnated with fixed air, and also with the fossil alkali. It has a grateful and somewhat pleasant taste, and a pungent smell, which affects the whole head. If it be heated, it emits a penetrating acid sulphureous smelling vapour. It will not bear carriage.

It operates chiefly by insensible perspiration; and sometimes by spitting, by sweat, and by urine.

In its general virtues it resembles the *German Spaw* waters.

LA MARQUISE, et LA MARIE.

See Vabls.

LAN-

LANCASTER, or SALE's SPA,
In Lancashire.

This is a clear chalybeate water, powerfully diuretic, gently purgative, and vomits if taken to the quantity of several quarts.

Taken as an alterative it has the general virtues of the *Tunbridge* water.

L A T H A M,

In Lancashire.

It is a fine chrystalline chalybeate, of the nature of the *Tunbridge* water.

LLANDRINDOD,

In the county of Radnor, South Wales.

In this place there are three mineral springs:

1st. *The saline pump, or purging water.*

2d. *The sulphureous water, commonly called the black stinking well.*

3. *The chalybeate rock water.*

The

The *saline purging*, or *pump water*, may be used as a *purge* twice in a week. It is directed to be drank at the fountain head by half pints, till it begins to operate; the patient walking or riding about between each draught. It operates also by urine.

For an *alterative*, about three pints are directed to be drank in a day. A pint and half in the morning before breakfast, at three draughts, a quarter of an hour between each half pint. The other pint and half likewise at three draughts: one an hour before dinner; another about six o'clock in the evening; and the third going to bed. If the body remains costive, the quantity must be increased. The course should be continued several weeks; and the most proper season is the summer.

It is also used as a bath and fomentation.

It is recommended both internally and externally in the scurvy, leprosy, tetters, King's evil, and all cutaneous foulnesses.

It is also prescribed in the gravel, the
hypo-

hypochondriacal disease, indigestion, and in other complaints.

The sulphureous water; called also the *black stinking water*, from its strong smell, and the blackness of the channel through which it passes.

The quantity to be drank cannot in general be determined. But it is best to begin with small doses, from a pint to a quart in the morning, taken at repeated draughts. The quantity may be encreased as the constitution will bear; or as much as will set easy on the stomach, and pass off well. When it gives the least uneasiness, it is a sign that the dose is too large.

It is also used outwardly, by way of bath or fomentation.

It is recommended in a variety of complaints. In the King's evil, scurvy, leprosy, and all cutaneous diseases. In the jaundice, hypochondriacal, and other disorders arising from obstruction. In the gravel, rheumatism, gout, bloody flux, hectic

hectic fever, weaknesſes of the limbs, want of digestion, and many others.

The *chalybeate*, or *rock water*, is limpid and transparent, as taken from the fountain, but on ſtanding ſoon loſes theſe qualities, together with its chalybeate taſte. Mixed with ſugar and rough cyder as it is taken up from the ſpring, it excites a brisk fermentation.

It is recommended in ſuch chronic diſtempers as proceed from laxity of the fibres, and weakneſs of the muſcular ſyſtem. In weakneſs of the nerves; in paralytic complaints; and the like.

It is alſo good in ſcorbutic caſes; in moiſt and convulſive aſthmas; in obſtinate agues; in obſtructions of the lower belly; in wandering, flow, nervous fevers; and in diſorders ariſing from obſtruction.

L L A N G Y B I,

In Caernarvonſhire, North Wales.

The water has an harſh taſte, inclining to bitter.

M

It

It has been found efficacious in disorders of the eyes ; in the King's evil ; scald heads ; ulcers ; eruptions of the skin ; the scurvy ; the itch, &c. Also in rheumatisms, palsy, and convulsions fits.

This water has long been in repute in the neighbourhood.

LEAMINGTON.

This is of the nature of *Barrowdale water*, but much weaker. The dose for a purge is from a quart to four or five pints, and it likewise usually vomits.

LEEZ,

Near the Earl of Manchester's, Essex.

It is a chalybeate water, similar to those of *Islington* and *Hampstead*.

LINCOMB,

Near Bath, in Somersetshire.

This is a chalybeate and acidulous water, containing also the fossil alkali, with a small quantity of purging salt. It soon loses its
virtue

virtue if exposed to the air; and in a few days also in bottles.

It resembles, in its virtues, the waters of *Thetford* and *Ilmington*.

L I S B E A K,

In the parish of Killashee, in the county of Fermanagh, Ireland.

Here are two strong sulphureous waters, much of the same kind.

Their contents and virtues resemble those of the *Swadlingbar* water.

L I S - D O N E - V A R N A,

In the county of Clare, in Ireland.

This is a strong chalybeate water, and manifests itself as such both to the taste and smell. It is also impregnated with the fossil alkali.

It keeps its virtue in well-corked bottles.

It usually vomits and purges on first drinking, but afterwards operates by urine.

It seems to resemble, in virtues, the *Thetford* and *Ilmington* waters.

L O A N S B U R Y,

In Lord Burlington's park, in Yorkshire.

This is a sulphureous water, weakly impregnated with a purging salt.

It seems to be of the nature of the *Askeron* water; but is only used at present for washing mangy dogs and scabby horses.

M A C C R O O M P,

In Ireland, about sixteen miles from Cork.

This is a chalybeate water, impregnated with the fossil alkali, and resembles the *Thetford* and *Ilmington* waters.

M A H E R E B E R G,

Situated near Branden Bay, in the county of Kerry, Ireland.

It is of the nature of the *Barrowdale* water. The dose for a purge is from a pint to a quart.

M A L L O W,

M A L L O W,

In the county of Cork, Ireland.

This is a warm water, perfectly limpid and pleasant tasted, and keeps long in bottles well corked.

It is recommended in most cases for which the *Bristol* water has been used.

M A L T O N,

The spring lies at the west end of the town of New Malton, in Yorkshire.

It is a strong chalybeate, abounding with fixed air when fresh drawn; has a saltish taste, and leaves a bitterness in the throat.

It operates by stool and urine. The dose is from three pints to twice that quantity. If the stomach be foul, it is apt to vomit. In its virtues it resembles the *Scarborough* water.

M A L V E R N,

In Gloucestershire.

There are two noted springs at this place,

M 3

one

one of them called the *Holy Well*, in the midway between Great and Little Malvern, the other is about a quarter of a mile from Great Malvern. But the waters are not materially different.

They are light and pleasant chalybeates, and are remarkable for being almost entirely free from any earthy matter. For three quarts of the Holy Well water being evaporated, scarce the fourth part of a grain of sediment was left behind.

They are recommended as excellent in diseases of the skin; in leprosies; scorbutic complaints; the King's evil; glandular obstructions; scald heads; old sores; cancers, &c. They are also serviceable in inflammations and other diseases of the eyes; in the gout and stone; in cachectic, bilious, and paralytic cases; in old head aches, and in female obstructions.

The external use is by washing the part under the spout several times in a day; afterwards covering the part with cloths dipt in the water, which must be kept constantly

constantly moist. Those who bathe, usually, go into the water with their linen on, and dress upon it wet, and it is never found to be attended with inconvenience.

The waters, when first drank, are apt to occasion, in some, a slight nausea; others they purge briskly for several days; but they operate by urine in all.

It is adviseable to drink freely of the waters for some days before they are used externally.

MARKSHALL,

In Essex.

This is a chalybeate water, resembling those of *Islington* and *Hamstead*.

MATLOCK,

Near Wirksworth, in Derbyshire.

At this place (which is perfectly romantic) are several springs of warm water, which appear to be of the nature of the *Bristol* water, except that it is very slightly impregnated with iron.

Its virtues are similar to those of the *Bristol* and *Buxton* waters.

The baths are recommended in rheumatic complaints, in cutaneous disorders, and in other cases where warm bathing is serviceable.

There are great numbers of petrifications in the course of this water.

M A U D S L E Y,

Near Preston, in Lancashire.

The water is of a bluish colour, has a foetid smell, and a brackish taste.

It is a strong sulphureous water, and is also impregnated with sea salt.

It is purgative, and has nearly the same virtues as the *Harrogate* water.

M E C H A N,

In the county of Fermanagh, Ireland.

In this place there are two sulphureous springs, both of the same nature.

They

They contain the fossil alkali, and in their virtues resemble the *Drumgoon* and *Swadlingbar* waters.

M I L L A R's S P A W,

Stockport, in the county of Lancaster.

It is a chalybeate water of the nature of that of *Tunbridge*, and seems to be stronger of the iron.

M O F F A T,

In the county of Annandale, Scotland.

At this place there are two springs or wells.

They are both sulphureous, and have a strong smell and taste; the upper one is the strongest, and most nauseous, and is less drank of than the other, though as it bears heat better it is most used for bathing.

The Moffat water is alterative, and diuretic, but it sometimes purges.

The quantity to be drank is three or four English quarts in a day. Those of weakly constitution

constitutions, and children, less in proportion.

It is recommended to clear the first passages previous to a course of the water; and salts are also directed to be dissolved in it if it does not pass off readily. Letting blood is advised if it stays in the body too long.

The water must be refrained from if the patient has a cough, and in tubercles of the lungs. In hectic cases it must also be drank with caution. These cases excepted, it may be used with great freedom.

It is much recommended in disorders of the skin, in scrophulous and scorbutic complaints, in chronic obstructions, in female weakneses and barrenness, in cholics, and other pains of the stomach and bowels.

Externally, it is employed for washing scrophulous sores, and foul ulcers; cloths wetted with it are also directed to be applied. It has been warmed and used by way of bath

bath to particular parts, and to the whole body; but it should not be made too hot.

The hot steam has been used with success for softening and relaxing hard swelled parts, and stiff joints.

In these and the like complaints, it may be used both internally and externally.

M O S S H O U S E.

Near Maudsley, in Lancashire.

This is a brisk chalybeate water, and in its virtues resembles those of *Hampstead* and *Islington*.

M O R E T O N, or M O R E T O N - S E E.

Situated about two miles West of Market-Drayton, in Shropshire.

It is esteemed as an excellent cooling and diuretic purge. It operates briskly; is pungent to the taste, and seems to be of the nature of *Holt* water.

M O U N T

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M O U N T D' O R,

*Seven leagues from Clermont, in the Auvergne,
France.*

This water is warm, and of the nature of
the *Aix-la-Chapelle*.

Taken internally it acts as a diuretic,
and it sometimes purges. Bathing in it
sweats profusely, without weakening the
patient.

It has been recommended in the rheuma-
tism, gout, palsy, and many other dis-
orders.

M O U N T P A L L A S,

In the county of Cavan, Ireland.

It is a chalybeate water, and seems to be
of the nature of the *Athlone*.

N E V I L - H O L T,

Near Market-Harborough, in Leicestershire.

This is an exceeding clear water as it falls
from the spout, and is void of all smell.

It

It has a brisk austere bitter, yet not disagreeable taste, and abounds in fixed air.

Exposed to the air, it soon becomes turbid, and spoils. But in well closed bottles it will keep good.

Drank to the quantity of several pints, it proves purgative, and operates without griping.

It also operates by urine and sweat.

It is a powerful antiseptic in putrid diseases.

When taken as an alterative, it must be taken in small doses, from a few spoonfuls, to a quarter or half a pint several times in a day, according to its effect; and a little brandy, or the like, may be added if it sits cold on the stomach.

It is esteemed an excellent remedy in old dysenteries and diarrhæas, in internal hemorrhages, in the fluor albus, and gleet, in the gravel, in rheumatisms, and for the worms;

worms ; it is good in atrophies, in bloated constitutions, and dropfical complaints, in scorbutic disorders, in want of appetite, and in other cases ; in inflammatory complaints however, and where there is an acidity of the humours, it does mischief.

Externally, it is a speedy cure for fresh wounds, for inflamed eyes, and hectic ulcers, &c. especially if taken inwardly at the same time.

NEW CARTMAL,

See Rougham.

NEWNHAM REGIS,

In Warwickshire.

There are three wells at this place : they are all of them chalybeate, laxative, and diuretic ; and seem to resemble the *Scarborough* water.

They have somewhat of a sulphureous smell.

NEW-

NEWTON DALE,

In the North Riding of Yorkshire.

This is a cold petrifying water.

It is said to cure effectually, loosenesses, and bleedings of every kind; and that it restores weakened joints, though beginning to be distorted, by bathing in it,

NEWTON STEWART,

Near Castlehill, in the county of Tyrone, Ireland.

It is a chalybeate water, of the nature of that of Tunbridge.

NEZDENICE,

In Germany.

About half a mile from Hunnobroda, in the district of the Castle of Banow. The spring is near this village.

This is an acidulous water, impregnated with fixed air like those of Seltzer and Pyrmont.

It

It is in great repute among the people in the neighbourhood, for the cure of many disorders, particularly those in which the waters just mentioned are serviceable.

N O B B E R,

In the county of Meath, Ireland.

It is a vitriolic water, and resembles those of *Hartfell* and *Crosstown*.

N O R M A N B Y,

Four miles from Pickering, in Yorkshire.

It is clear, beautiful, and foetid, and when poured out sparkles like Champagne.

It is a sulphureous, and gently purgative water, and resembles the *Askeron* water in virtues.

N O R T H - H A L L,

See Barnet.

N O T.

N O T T I N G T O N,

Near Weymouth, in Dorsetshire.

This is a strong sulphureous water.

Its flavour resembles that of boiled eggs; and its colour, in a tin vessel, is blue. A shilling put into it at the fountain head, becomes, in a few minutes, blue.

It contains the fossil alkali, with a little earth.

It is in repute for curing foulnesses of the skin.

O R S T O N,

In the county of Nottingham, near Thoroton.

This water has a delicious, gentle, rough, sweetish, chalybeate taste, and a slight sulphureous smell. It is replete with fixed air, sparkles and flies when poured out into a glass, and makes the heads of those who drink it giddy.

It soon spoils by exposure to air.

It is purgative, and seems to be possessed of the same virtues as the *Hartlepool* water. It makes the tongue and stools black, like many other chalybeate waters.

O U L T O N,

In Norfolk.

It is a light chalybeate water, similar to that of *Islington*.

O W E N B R E U N,

In the county of Cavan, Ireland.

This is a sulphureous water, impregnated with a purging salt, and a little native alkali.

Its virtues resemble those of the *Askeron* water.

P A N C R A S,

In Middlesex, near London.

The water is almost insipid to the taste.

It is impregnated with a purging salt, together with a small portion of sea salt.

It is therefore a purgative water, and is also diuretic.

Its virtues are allied to those of the *Cheltenham*

tenham water, and it is also of service in the stone, gravel, and similar disorders.

P A S S Y,

Near Paris, in France.

It is a clear, colourless, chalybeate water, with a subacid taste, and ferruginous smell, and emits plenty of air bubbles.

It is a strong chalybeate water, but does not prove purgative, unless drank in large quantity. It is of the nature of *Pyrmont* water.

P E T E R H E A D,

In the county of Aberdeen, Scotland.

This is one of the strongest, and most famous chalybeate waters in Scotland. It is of the nature of our *Islington* water, but more powerful.

P E T T I G O E,

In the county of Donnegal, Ireland.

It is one of the strongest sulphur waters

in Ireland ; and is also impregnated with a purging salt.

In its virtues it resembles the *Askeron* water.

P L O M B I E R S,

In Lorraine, France.

The water is tepid and saponaceous, with a saltish taste.

It is recommended for complaints of the stomach proceeding from acidity ; in spitting of blood ; in hæmorrhages ; phthysical and asthmatic complaints ; in dropfy of the belly ; the diabetes ; fluor albus ; dysentery ; and in all cutaneous disorders.

It is drank from a pint to three quarts, on an empty stomach, in the morning ; it is diuretic and laxative.

It is also used outwardly as a bath ; and is reckoned excellent for washing ulcers.

P O N T G I B A U L T,

In the Auvergne, France.

The water is limpid, subacid, and vinous.

It

It contains the native alkali, together with calcareous earth.

It is diuretic and gently opening; and its virtues are allied to those of the *Tilbury* and *Seltzer* waters.

P Y R M O N T,

In Westphalia, Germany.

This is a very brisk, spirity chalybeate, abounding in fixed air; and when taken up from the fountain, sparkles like the briskest Champaign wine. It has a fine, pleasant, vinous taste, and a somewhat sulphureous smell. It is perfectly clear, and bears carriage better than the *Spaw* water.

Persons who drink it at the well are affected with a kind of giddiness or intoxication; owing, it may be supposed, to the great quantity of fixed air with which the water abounds.

The common operation of this water is by urine; but it is also gently sudorific; and if taken in large quantity proves

laxative. When, however, it is required to have this latter effect, it is usual to mix some salts with the first glasses.

It is drank by glassfuls in the morning to the quantity of from one, to five or six pints, according to circumstances, walking about between each glass.

It is recommended in cases where the constitution is relaxed. In want of appetite and digestion; in weakness of the stomach, and in heart-burn; in the green sickness; in female obstructions, and in barrenness; in the scurvy, and cutaneous diseases; and in the gout, especially when mixed with milk. In cholics; in bloody fluxes; in diseases of the breast and lungs; in which cases it is best taken lukewarm; in nervous, hysteric, and hypochondriacal disorders; in apoplexies and palsies; in the gravel, and urinary obstructions; in foulness of the blood; and in obstructions of the finer vessels. It amends the lax texture of the blood; exhilarates the spirits without inflaming, as vinous liquors are apt to do; and

and is among the best restoratives in decayed and broken constitutions.

This water possesses the general virtues of the *Spaw* water; and at the fountain it is even more spirity, as well as a stronger chalybeate. The reader therefore is referred to what is said of the *Spaw* water, for a further account of its virtues.

QUEEN CAMEL,

Near Sherborne, in Somersetshire.

The water has a fœtid, sulphureous smell, like the washings of a foul gun. It tinges silver of a yellow or black colour, and blackens the stones on which it runs. It is also said to be colder than common water.

It contains the fossil alkali, together with sea salt, a chalky earth, and a bituminous or sulphureous matter.

It has been used with success both inwardly and outwardly in cutaneous disorders, the scurvy, and the King's evil.

And for these purposes a place is contrived for bathing.

R I C H M O N D,

In the county of Surry.

This is a purging water, of the nature of those of *Acton* and *Pancras*.

R O A D,

In Wiltshire.

This a chalybeate water with a sulphureous smell, and is impregnated with the fossil alkali.

It is recommended internally and externally in scorbutic and scrophulous cases, and in cutaneous diseases, &c.

On first taking this water it acts as a gentle purge.

It does not bear carriage.

R O U G H A M,

In Lancashire.

It is of the nature of *Barrowdale* water, but much weaker.

The

The dose for a purge is from three to eight quarts. In that quantity it operates powerfully by stool, and also by urine.

SAINT BARTHOLOMEW'S WELL,
Ireland.

It is about two miles south-west from Cork.

The water is soft, and mixes smoothly with soap.

By keeping it putrifies, and then tinges silver, and throws up a stinking scum which has somewhat of an irony taste. Galls then give it a purple tinge, which they do not to the fresh water.

It contains an alkaline salt.

Its virtues are similar to those of the *Tilbury* water.

SAINT ERASMUS'S WELL.

*Situated on Lord Chetwynd's grounds in
Staffordshire.*

The water is of the nature of *Barrowdale*, but much weaker.

It is of the colour of sack, but without much taste or smell.

If drank to the quantity of several quarts, it operates powerfully by stool.

S A L E S S P A W.

See *Lancaster*.

S C A R B O R O U G H,

In Yorkshire.

The waters of this place are chalybeate and purging; and they are more frequented and used than any other water of this class in England.

There are two wells; the one more purgative, the other a stronger chalybeate. Hence the latter (which is nearest the town) has been called the *chalybeate* spring, the other the *purging*; though they are both impregnated with the same principles, but in different proportions. The *purging* is the most famed, and is that which is usually called the *Scarborough* water.

When

When these waters are poured out of one glass into another, they throw up a number of air bubbles; and if shook for a while in a close stopp'd phial, and the phial be suddenly opened before the commotion ceases, they displode an elastic vapour with an audible noise, which shews that they abound in fixed air.

At the fountain they both have a brisk, pungent, chalybeate taste; but the *purging* water tastes bitterish, which is not usually the case with the *chalybeate* one.

They lose their chalybeate virtues by exposure, and also by keeping; but the purging water soonest.

They both putrify by keeping; but in time recover their sweetness.

Four or five half pints of the *purging* water drank within an hour, give two or three easy motions, and raise the spirits. The like quantity of the *chalybeate* purges less, but exhilarates more, and passes off chiefly by urine.

These

These waters have been found of service in hectic fevers, in weaknesſes of the ſtomach, and indigeſtion ; in relaxations of the ſyſtem ; in nervous, hyſteric, and hypochondriacal diſorders ; in the green ſickneſs, in the ſcurvy, rheumatism, and aſthmatic complaints ; in gleans, the fluor albus, and other preternatural evacuations, and in habitual coſtivenesſs. The waters are to be varied according to the intention to be answered.

SCOLLIENSES,

In Upper Rhoetia, Switzerland.

It is a chalybeate water, impregnated with the foſſil alkali ; and ſo full of fixed air, that it often burſts the bottles in which it is kept.

It makes the drinkers giddy, and operates mildly, though largely by ſtool, and by ſpitting.

It is eſteemed excellent for cholicky pains, both as a cure and preventative.

In its general virtues it reſembles the *Spaw* water.

SEA

S E A W A T E R,

Sea water has a salt, bitterish taste, appears of a greenish colour, and becomes foetid by keeping.

As an immense number of springs, rivers, &c. are continually emptying themselves in the sea, as it contains an almost infinity of animals and vegetables, and covers and washes such a variety of lands and shores, it would seem to be impregnated with very heterogeneous matters. Nevertheless, the water, in different parts of the ocean, appears to be nearly alike, and the difference in its contents appears to be much less than might at first be imagined.

It contains sea salt in great quantity. A chalky earth, or rather, what is called by the chemists, a calcareous marine salt: a bittern, from which the Epfom salts of the shops are prepared, and some unctuous and bituminous matters.

Sea water, in hotter climates, generally contains a greater proportion of these matters than that in colder ones, and therefore
is

is stronger. The difference, in some places, is above two to one.

Sea water taken internally, in small quantity, proves a stimulating and heating remedy, dissipating the finer fluids, and occasioning thirst.

In larger quantity it proves purgative. But differs from other purges in that patients who drink it daily for a considerable time, instead of losing, often gain strength by it.

It therefore acts, not merely as a purgative, but gives also a brisk stimulus to the stomach and intestines, thereby encreasing the appetite, and promoting digestion.

By means of this excellent property of sea water (viz. our being able to keep up a purging for a considerable time, without hurting the constitution), we are enabled frequently to remove disorders which have resisted the force of other remedies.

It is of excellent use in scrophulous complaints ;

plaints ; and glandular swellings are generally removed by it. If joined with the bark, it has sometimes a better effect in those cases.

It is also serviceable in purging off gross humours, which have been the consequence of indulging the appetite too freely, and leading an inactive life : also in cleansing the intestines of viscid mucus, and worms.

In cases where there is fever, heat, or inflammation, sea water is found to be hurtful. Previous to its use, therefore, these symptoms should be removed by bleeding, purging, and a proper cooling treatment.

As Sea water is specifically heavier than common water, and, (by reason of the saline matters contained in it,) is also more stimulating, it is more efficacious when used externally as a bath.

It has also particular virtues when externally used. On account of its stimulating and discutient property, it is excellent in the scrophula or king's evil, in hard swellings, in the bite of a mad dog, in the rickets, in
the

the dry leprosy, and itch, in paralytic and scorbutic complaints, and in many other cases. But in most of these, it is proper to use it both internally and externally.

S E D L I T Z,

Germany,

A village in Bohemia.

This purging water is of the same nature as our Epsom, but much stronger.

Two or three tea cups full are generally sufficient for a dose; and the strongest constitution scarce requires more than a pint.

S E L T Z E R,

In Germany.

This spring is near to the town of Neider, or Lower Seltzer, about three leagues from Franckfort on the Maine, in the Lower Archbishoprick of Treves.

It rises near a small trout stream. The country and avenues around are delightful, and afford a very pleasing prospect.

The

The water issues forth with great rapidity; is remarkably clear and light, and on pouring it from one vessel to another, plenty of air bubbles arise.

It has, at first, somewhat of a brisk sub-acid pungent taste, but leaves behind a lixivial one.

If exposed twenty-four hours to the air, it loses entirely its original taste, and acquires that of a flat alkaline ley. But no sediment is deposited.

It putrifies sooner than any other medicinal water.

When fresh, it makes an immediate effervescence with acids, but especially with Rhenish wines, and a little powdered sugar.

It also curdles with a solution of soap.

It does not change purple with galls; and therefore contains no chalybeate.

Oil of tartar dropt into it makes it milky, but does not occasion a precipitate.

It contains an alkaline salt, together with a small quantity of calcareous earth, and sea salt, and it abounds in fixed air.

The operation of this water is chiefly by urine, for it has no purgative virtues. It corrects acidities, renders the blood and juices more fluid, and promotes a brisk and free circulation. Hence it is good in obstructions of the glands, and against gross, and viscid humours.

It is of great use in the gravel and stone, and in other disorders of the kidneys and bladder.

It is also excellent in gouty and rheumatic complaints*, especially when mixed with milk.

† It is drank with great success in scorbutic, cutaneous, and putrid disorders.

* In these disorders its virtue is said to be much improved by the addition of Rhenish wine, and a little sugar.

† Asses, or goats milk, is usually preferred.

It

It is good against the heart-burn; and it is also an excellent stomachic. Several pints may be drank in the course of a day.

On account of its diuretic quality, it is of service in dropfical complaints.

Mixed with asses milk, it is of great use in consumptive cases, and in disorders of the lungs.

It is in great esteem in nervous disorders, either with, or without milk, as is found to be most suitable to the constitution.

It is also of service in hypochondriacal, and hysteric complaints, and in obstructions of the menses, especially if exercise be used.

It is given in purgings and fluxes arising from acidity in the bowels, with good success.

Drank by nurses, it is said to render their milk more wholesome and nourishing to children, and to prevent it from turning sour on their stomachs.

As the fixed air of this water so soon flies off, it ought either to be drank on the spot, or at least should be impregnated with a fresh quantity previous to its being taken, according to the directions given in the beginning of this treatise.

Those persons, with whose stomachs water alone does not so well agree, are advised to mix with it some generous and agreeable wine, in cases where wine will not be hurtful. (See also *Spaw* and *Pyrmont* waters.)

SEN E, or SEN D,

Near the Devizes, Wiltshire.

At this place are two chalybeate springs, one of them stronger than the other, but both resembling in virtues the *Hampstead* and *Islington* waters.

They are diuretic, but not purgative.

At a village called *Paulsholt*, near this place, is another chalybeate spring.

SEY D-

S E Y D S C H U T Z,

In Germany.

It is situated near to that of *Sedlitz*, and is of the same purgative nature, but somewhat stronger.

S H A D W E L L,

Near London, situated in Sun Tavern Fields.

This is a vitriolic chalybeate water; that is, it is impregnated with green copperas, or vitriol of iron, and is one of the strongest waters of the kind in England; it also contains iron held in solution by fixed air, or aërial acid.

It has an acid, austere, vitriolic taste, and with galls, gives a bluish black colour like ink.

It has been taken inwardly to the quantity of a pint, divided into two or three doses in the course of an hour in the morning. It vomits, and gently purges; it turns the stools black.

It has been found of service in the fluor albus, in obstinate gleets, and dysenteries; in inward bleedings; in the jaundice; and in scorbutic, and leprous cases. But it has chiefly been used externally for sore eyes, the itch, scabs, tetters, scald-head, ulcers, fistulas, and the like, by washing, or else applying linen rags dipped in it, to the parts.

In scorbutic and leprous cases, the internal use is first advised 'till the eruptions are thrown out, which are then to be removed by the outward application of the water.

S H A P M O O R,

The spring is situated in a marshy heath, between Shap and Orton, in Westmoreland.

This is a sulphureous water, impregnated with a purging salt,

Three pints of it prove purgative,

In its virtues it seems to resemble the *Askeron* water,

S H A T.

S H E T T L E W O O D,

*Situated between Bolsover and Romeley, in
Derbyshire.*

It is a sulphureous water, impregnated
with sea salt.

Its virtues resemble those of the *Harro-*
gate water.

S H I P T O N,

In Yorkshire.

It is a sulphureous water, impregnated
with sea salt, together with a purging salt.

In its virtues it resembles the *Harrogate*
water.

S O M E R S H A M,

In Huntingdonshire.

This is a chalybeate water, impregnated
with green vitriol and allum, and contains
also fixed air.

The season for drinking it is from May
to October.

It is drank in the morning to the quantity of several glaffes. It is recommended in debilities of the ftomach and bowels, in dyfenteries, hæmoroids, and worms, in nidrous crudities, in obftuctions of the liver and fpleen, in uterine complaints, in the ftone and gravel, in the fcurvy, in hyfteric and hypochondriacal diforders, and many others.

It is proper to purge before and after the courfe, and falts may alfo be occasionally added to it.

Externally it is applied to foul ulcers and cancers.

S P A W,

In the bifhoprick of Leige, Germany, twenty-one miles South East from the town of Leige.

In and about this town there are feveral fountains, which afford excellent chalybeate waters: and in Great Britain, they are the moft drank of any foreign mineral waters.

The

The principal springs are,

1. The POUHON, or POUHON, situated in the middle of the village.
2. SAUVENIERE, about a mile and a half east from it.
3. GROISBECK, near to the Sauveniere.
4. TONNELET, a little to the left of the road to the Sauveniere.
5. WARTROZ, near to the Tonnelet.
6. GERONSTERRE, two miles south of the Spaw.
7. SARTS, or NIVESET, in the district of Sarts.
8. CHEVRON, or BRU, in the principality of Stavelot.
9. COUVE,
10. BEVERSE,
11. SIGE,
12. GEROMONT.

} All near Malmdy.

The POUHON, is a flow deep spring, and is more or less strong or spirity according to the state of the atmosphere.

It is a chalybeate and acidulous water, highly impregnated with fixed air, and contains also the fossil alkali, with some earthy matter.

It

It is in its most perfect and natural state in cold, dry weather. It then appears colourless, transparent, and without smell, and has a subacid chalybeate taste, with an agreeable smartness: at such times, if it be taken out of the well in a glass, it does not sparkle; but after standing awhile, covers the glass on the inside with small air bubbles; but if it be shaken, or poured out of one glass into another, it then sparkles, and discharges a great number of air bubbles at the surface.

In warm, moist weather, it loses its transparency, appears turbid or wheyish, contains less fixed air, and is partly decomposed. A murmuring noise also is sometimes heard in the well.

It is therefore in its greatest perfection when the weather is cold and dry.

It is colder than the heat of the atmosphere by many degrees.

It is supposed to contain the greatest quantity of fixed air of almost any acidulous

lous water ; and in consequence thereof has a remarkable sprightliness and vinosity, and boils by mere warmth. This, however, soon flies off, if the water be left exposed ; though in well corked bottles it is in a great measure preserved.

It is capable of dissolving more iron than it naturally contains, and thereby becomes a stronger chalybeate. This is owing to the great quantity of fixed air which it contains.

For the same reason an ebullition is raised in this water on the addition of acids, by reason that they disengage its fixed air.

It mixes smoothly with milk, whether it be cold or of a boiling heat.

SAUVENIER. It is of the same nature with the POUHON water, and seems to be even more acidulous. For it dissolves more iron ; stands longer fine ; and preserves its purple tinging quality for a greater length of time.

At the well it has somewhat a smell of sulphur.

GROISBECK. The water is of the same nature with that of POUHON, but is more acidulous; has a vitriolic taste, and somewhat of a sulphureous smell.

TONNELET. This water seems even to surpass that of POUHON, and has been too much neglected *. It is one of the most sprightly waters in the world. It is much colder than either of the Spaw waters; has no smell; is bright, transparent, and colourless; and from the rapidity of its motion does not foul its basin. It has a smart, subacid, sprightly taste, not unlike the briskest Champaign wine.

From a variety of experiments it appears, that this water is more strongly charged than any of the others with fixed air, on which the *energy* of all waters of this kind depend.

WAR-

* The *Tonnelet* spring, so much extolled by Dr. Lucas, is, as I am informed by Dr. Simmons, now almost deserted; and so is the *Wartroz*.

WARTROZ. Its situation is lowest of any of the springs about Spaw, and is more apt to be foul. But when the well is cleaned out, and the water pure, it is found to be of the same nature as that of POUHON. It is not purgative, as some have asserted.

GERONSTERRE. It resembles the POUHON water in its brisk, acidulous, and chalybeate taste; and has also a sulphureous smell at the fountain, which it loses by being carried to a distance. This smell is strongest in warm moist weather.

The air, or vapour, of this water affects the heads of some who drink it, occasioning a giddiness, or kind of drunkenness, which goes off in a quarter or half an hour. The Pyrmont, and several other brisk chalybeate waters, are found to have the same effect.

It bears carriage as well as the other *Spaw* waters, though the contrary opinion has been industriously propagated. It is colder than any of the springs, the *Tonnelet* excepted.

It

It does not seem to contain so great a quantity of fixed air as the *Poboun*, and some of the other *Spaw* waters.

SARTS, or NIVASET. It resembles the *Tonnelet* water, but is rather less brisk and vinous. It is however more acid and styptic.

BRU, or CHEVRON. It approaches to the nature of the *Tonnelet* water. The physicians at Leige have artfully decried this water, because it is not in the principality of Leige. But by every trial it appears not to be inferior to any of the *Spaw* waters.

COUVE and BEVERSE. The *Couve* nearly resembles the *Tonnelet* water; or rather, may be placed in a medium between that and the *Wartroz*. It hardly equals the transparency, smartness, and generous vinous taste of the first, but it greatly surpasses the latter. The *Beverse* agrees with this, only that it does not retain its smartness so well by keeping.

LA SIGE. It has some of the general properties of the *Spaw* waters, but in other respects it is different.

It

It is moderately subacid, smart, and grateful, but has no sensible chalybeate taste.

It sparkles like Champaign wine when poured from one glass to another. Upon standing it loses its fixed air, and throws up a thick mother of pearl coloured pellicle.

It is much more loaded with earthy matters, and less impregnated with iron and fixed air than the other Spaw waters.

GEROMONT. As a chalybeate and acidulous water it seems to be nearly of the same strength with the *La Sige*; but it contains a greater quantity of the fossil alkali, together with a mixture of sea salt. The earthy matters, however, are less.

Their Virtues, &c.—It appears, that these waters are compounded of nearly the same principles, though in different proportions. All of them abound with the mineral elastic spirit, or *fixed air*. They contain more or less iron, fossil alkali, and calcareous and selenitical earths; together with
a small

a small portion of sea salt, and an oily matter common to all waters. These are all kept suspended, and in a neutral state, by means of the aërial acid, or fixed air.

From a review of the contents of these waters, it cannot be imagined that their virtues principally depend on the small quantity of *solid* matters which they contain. They must therefore depend mostly on their subtle mineral spirit, or *fixed air*. And they are probably rendered more active and penetrating both in the first passages, and also when they enter the circulation, by means of that small portion of iron, earth, salt, &c. with which they are impregnated.

These waters are diuretic, and sometimes purgative; like other chalybeate waters they tinge the stools black.

They exhilarate and affect the spirits with a much more kind and benign influence than wine or spirituous liquors; and their general operation is by strengthening the fibres.

fibres. They cool and quench thirst much better than common water.

They are therefore found excellent in cases of universal languor or weakness, proceeding from a relaxation of the stomach, and of the fibres in general, and where the constitution has been weakened by diseases, or by too sedentary a life. In weak, relaxed, gross habits; in nervous disorders; in the end of the gout and rheumatism, where the constitution needs to be repaired; in such asthmatic disorders and chronic coughs as proceed from too great a relaxation of the pulmonary vessels; in obstructions of the liver and spleen; in cases where the blood is too thin and putrescent, occasioned by irregularities, or by scorbutic or other putrid disorders; in hysterical and hypochondriacal complaints, where the fibres are too irritable and relaxed, and where the habit in general needs to be restored; in paralytic disorders; in gleets; in the fluor albus; in fluxes of the belly; and in other inordinate discharges proceeding from too great weakness or relaxation of any particular part; in the gravel and stone; in

female obstructions ; in barrenness ; and in most other cases where a strengthening and brisk stimulating resolving chalybeate remedy is wanted ; and where there are no confirmed obstructions, or so much heat and fever as to forbid their use.

They are, however, generally hurtful in hot, bilious, and plethoric constitutions, when used before the body is cooled by proper evacuations. They are also hurtful in cases of fever and heat ; in hectic fevers and ulcerations of the lungs, and of other internal parts, particularly where there is no free outlet to the matter ; and also in most confirmed obstructions attended with fever.

The usual season for drinking them is in July and August, or during the summer months from May to September. The water, however, is best in the winter, and in dry, frosty weather ; and probably might then be drank to greatest advantage.

If they lie cold on the stomach, a few carraway seeds, cardamoms, or other aromatic,

matic, may be taken with them. The vessel out of which it is drank may also be warmed with hot water, or a little warm water may be added immediately before drinking. It must always be drank before noon.

The quantity to be drank should be different according to the age, constitution, and other circumstances of the patient. The only certain rule is, that quantity which the stomach can bear without heaviness or uneasiness. The greater the quantity any one drinks, the better, provided it agrees, and passes well off. It is adviseable to begin with drinking a glass or two several times in a day, encreasing the quantity daily, as far as the stomach will bear. To continue that dose during the course, and to finish by lessening it by the same degrees by which it was augmented. Moderate exercise is proper after drinking. It is to be continued for several weeks or months, according to the circumstances.

Previous to the use of the water, it is proper to cleanse the first passages by gentle purges, and if judged necessary, an emetic

also should be given. During the course, likewise costiveness should be prevented, by occasionally adding Rochel salts, or rhubarb, to the first glasses of water in the morning.

When there is too much heat, the saline draughts, nitre, vegetable acids, or the like, should be given, and the elixir of vitriol has been added to the water, in intermittent feverish complaints, with good effect.

A cooling regimen should be observed while drinking these waters, as also regular hours, and quietness, or chearfulness of mind.

In cases of rigidity of the fibres, the warm bath is recommended, among the best preparatives to a course of these waters; and, hence bathing at *Aix-la-Chapelle*, or at *Chaud Fontaine*, is often premised. The warm bathing may occasionally be repeated during the course. In opposite cases, the cold bath is recommended.

The Spaw water is used also externally,
in

in a variety of cases, with good success. It is used as an injection in the fluor albus, and in ulcers and cancers of the womb, and also in the gonorrhœa; it is serviceable in venereal aphthæ, and ulcers in the mouth. It is used to wash phagadenic ulcers: it is recommended by way of gargle for relaxed tonsils, and for fastening loose teeth; it is also good in other relaxations; and it is said to cure the itch, and similar complaints, by washing and bathing; an internal course being also observed at the time.

As the Spaw waters are impregnated with different proportions of the same ingredients, they may be chosen differently, according to the intentions we have in view. The *Poboun* is the strongest chalybeate. The *Tonnelet* and *Geronsterre*, are weaker chalybeate, but are brisker, and rather more spirituous. The *Groesbeck*, *Sauveniere*, and *Wartroz*, are still weaker chalybeates, but highly impregnated with calcareous and selenitical earths, and contain also a greater proportion of the fossil alkali. The *Germont*, is likewise a weak chalybeate, but contains a great deal of calcareous and sele-

nitical earth, and about three times as much alkaline salt as any of the others. The four last waters, therefore, will be better in disorders arising from an acid cause, and as diuretics, particularly the *Geromont*.

S T E N F I E L D,

In Lincolnshire.

It is a chalybeate laxative water, and resembles that of *Orston*. It is light, clear, pleasant tasted, and full of spirit at first, but on long standing in its large reservoir spoils.

S T R E A T H A M,

In Surry, near London.

The water has a yellowish tinge, and throws up a scum variegated with blue, green, and yellow. Its taste is somewhat saline and disagreeable.

It is a mild purging water, and may be drank to the quantity of three or four pints.

It is also diuretic, and is said to be found useful in disorders of the eyes.

STANGER,

S T A N G E R,

Near Cockermouth, in Cumberland.

This is a salt chalybeate, or vitriolic water; and, when drank to four or five pints, operates with violence both upwards and downwards.

S T O K E.

See Jessop's Well.

S U C H A L O Z A,

About a mile from Hungarian Broda, in Germany.

It is an acidulous water, resembling that of *Nezdenice* in virtues.

It is greatly esteemed in the neighbourhood for the cure of scrophulous and other disorders, in which waters of this kind are serviceable; and is drank with victuals instead of small beer and wine.

S U T T O N B O G,

In the county of Oxford, near to Northamptonshire.

This is one of the waters termed *sulphureous*.

It has an intolerable foetid smell, like rotten eggs. Its taste is saltish and pungent, like soap lees.

It throws up a blue scum, and the mud at the bottom is jet black. In half an hour it turns silver of a copper colour.

It contains an alkaline salt, together with a little sea salt.

It is a mild laxative, or purging water.

It is used both for drinking and bathing; and ulcers, tumours, scrophulous, and other diseases of the skin are successfully washed with it. The mud is also made use of.

SWADLINGBAR,

In the county of Cavan, Ireland.

The water is sometimes transparent and colourless; at other times somewhat whitish.

It has a strong sulphureous smell, which it retains long in bottles well corked. It tinges silver of a blackish or copperish colour.

The

The well is commonly covered with a whitish or bluish scum ; and deposits a mud which burns, on the red hot iron, with a blue flame.

It contains the fossil alkali, together with a little sea salt and earth.

It resembles in its virtues the water of *Drumgoon*.

S W A N S E Y,

In Glamorganshire, North Wales.

It is impregnated with green copperas, and therefore is of the nature of the *Shadwell* water.

Taken inwardly it is also said to stop purgings ; applied outwardly it stops bleeding.

S Y D E N H A M,

In Kent, near London.

The water is somewhat bitterish to the taste.

It is purgative, and of the nature of *Epsom* water, but weaker.

T A R-

TARLETON,

Eight miles from Preston in Lancashire.

This is a chalybeate water, and drank to the quantity of three or four pints proves purgative. In its virtues it seems to resemble the *Scarborough* water. It has a somewhat sulphureous smell when first drawn.

TEWKSBURY,

In Gloucestershire.

It is a purging water, of the nature of those of *Acton*, *Pancras*, and *Epsom*.

There are two other springs of the same kind in the neighbourhood; one of them is in Walton grounds, the other in Teddington grounds.

THETFORD,

In the county of Norfolk.

This is a chalybeate and acidulous water, and contains also the fossil alkali.

It operates by urine, and also gently by stool.

It

It is recommended in pains of the stomach and bowels ; in loss of appetite ; in relaxed state of the fibres ; in hysteric disorders ; and in beginning consumptions.

THOROTON,

Near Newark upon Trent, Nottinghamshire.

It is a chalybeate laxative water, resembling that of *Orston*.

THURSK,

In the North Riding of Yorkshire.

It is a brisk, sparkling, chalybeate water, and is also purgative and diuretic. It resembles the *Scarborough* and *Cheltenham* waters.

TIBSHELF,

In Derbyshire.

This is a fine clear chalybeate ; and when poured from one glass to another, sparkles like the *Spaw* water, which it resembles in virtues.

TIL-

T I L B U R Y.

The spring which affords this water is situated near a farm house at West-Tilbury, near Tilbury-Fort, in Essex.

This water is not quite limpid at the well, but is somewhat straw-coloured.

It is soft and smooth to the taste; though after being agitated in the mouth, it leaves a small degree of roughness on the tongue.

It throws up a scum variegated with several colours, which feels greasy; and effervesces with spirit of vitriol.

It mixes smooth with milk, but curdles with soap. When boiled it turns milky; a fourth part of mountain wine fines it immediately; and all acids do the same.

It operates chiefly by urine; though it is also somewhat purgative; and increases perspiration.

It is in esteem for removing glandular obstructions. It is good in bloody fluxes, purgings, and the like. In disorders of the stomach

stomach arising from acidity ; in the gravel ; fluor albus ; and immoderate flux of the menses.

As a diuretic it is good in dropical complaints.

It gently warms the stomach ; strengthens the appetite ; and promotes digestion. It is also of service in lowness of spirits. From its efficacy in removing obstructions of the glands, it is recommended in scurvy and cutaneous diseases ; and its virtues in these complaints seem to be confirmed by the tingling which it occasions in the skin.

The dose is usually a quart in a day.

The water is supposed to owe its virtues to a native alkaline salt, which may be obtained from it by evaporation, and to its *fixed air*.

T O B E R B O N Y,

In Ireland.

This spring is situated about four miles north of Dublin.

The

The water is sweet, and soon lathers with soap.

Before rain and wind it yields a fetid smell. Its sediment, when placed on hot iron, turns black and fetid.

It contains an alkaline salt, together with a calcareous earth, and an oily or bituminous matter.

Its virtues are similar to those of the *Tilbury* water, but in a less degree.

T O N S T E I N.

In the Bishoprick of Cologne, Germany.

This is among the most noted waters of Germany.

The water has a brisk subacid taste, at the fountain, which is lost by exposure to the air.

It is clear and limpid when taken up from the well, but becomes turbid by standing; owing to the loss of its fixed air.

It contains an alkaline salt, together with a little chalky earth, and sea salt.

Its

Its virtues are similar to those of the *Seltzer* waters, but it is more purgative.

It may also be used with advantage for common drink, either by itself or mixed with wine; and that either in acute or chronic diseases, where diuretic or deobstruent remedies are required.

T O W N L E Y,

See *Hanbridge*.

T R A L E E,

In the county of Kerry, Ireland.

It is a chalybeate water, of the nature of that of *Castleconnel*.

T U N B R I D G E.

The WELLS are situated about five miles from the town of Tunbridge, in Kent.

This is at present one of the most famous chalybeate waters in England, and the most resorted to of any, though it does not seem to be preferable to many others in this kingdom.

It

It is a brisk, light water, has a ferruginous taste, and contains also a little sea salt.

Exposed to the air it soon loses its virtues; as it does also in a few days in bottles.

It is usual at times to mix with the first glass of the water, taken in the morning, either a little common salt, or some other purging salt, in order to make it operate by stool. If the stomach be foul, it is apt to vomit.

It is chiefly resorted to in June, July, and August; and is recommended in all those disorders in which the celebrated *Spaw waters of Germany* are serviceable. It possesses the same general virtues as those waters, but in a less degree.

U P M I N S T E R,

Near Brentwood, in Essex.

This is a strong sulphureous water, impregnated with a purging salt, and the fossil alkali.

It is purgative and diuretic; and in its virtues seems to resemble the *Askeron* water.

V A H L S,

V A H L S,

In France.

The well is near Vahls, in Dauphiny.

The water has a brisk subacid taste at the spring; which is lost before it reaches Paris, for it then tastes saltish.

It contains the fossil alkali.

It is diuretic, and somewhat purgative; and is similar in virtues to the *Seltzer* and *Clifton* waters, though less powerful.

N. B. Near to this is another spring, called *La Marie*, but weaker.

W A R D R E W,

In Northumberland.

It is situated between Cumberland and Northumberland, on the banks of the river Arden.

It is the most cold sulphureous water in the three northern counties. It contains also sea salt, and therefore resembles in virtues the *Harrogate* water.

It loses both its smell and virtues by carriage and keeping.

WEATHERSTACK,

In Westmoreland.

This is a weak chalybeate water, but contains a large portion of sea salt. In the summer it smells of sulphur, but not in the winter.

It is purgative; and the dose is two or three pints.

WELLENBROW,

In Northamptonshire.

It is a light chalybeate water, resembling that of *Islington*.

WEST ASHTON,

In the parish of Steeple Ashton, Wiltshire.

It is a weak chalybeate water, resembling those of *Islington* and *Tunbridge*.

WESTWOOD,

Near Tanderley, in Derbyshire

This is a vitriolic chalybeate, somewhat resembling the *Shadwell* water.

It

It is recommended externally for old sores in the legs.

N. B. The coal waters, in general, in this part of the country, are also vitriolic.

W E X F O R D,

In Ireland.

It is an agreeable chalybeate water, similar in virtue to that of *Islington*.

W H I T E - A C R E,

Near Trales, in Lancashire.

This is a very clear, brisk chalybeate water, resembling that of *Lancaster* in virtues, but it is said rather to bind than purge.

W I G A N,

In Lancashire.

It is a clear chalybeate water, resembling those of *Hampstead* and *Islington*.

W I G G L E S W O R T H,

In the parish of Long Preston, in the West Riding of Yorkshire, four miles South of Settle.

The water is very black, and has a strong sulphureous smell, with a saltish taste.

Drank to the quantity of three quarts, it purges, and two quarts are said to vomit, though it is rather uncommon, that more should be required for the latter than the former.

W I L D U N G A N,

In the country of Waldeck, Germany.

This water at the fountain, has a brisk subacid taste, which it loses by exposure.

It is of the same kind with that of *Buch*, but weaker.

It is one of the mildest acidulæ known, and may be used as common drink alone, or mixed with a small portion of wine.

Though it is not esteemed strong enough to remove obstinate chronic diseases, and clear the first passages, yet it is excellent for blunting and dilating acrid, scorbutic, and gouty humours, when taken in large quantity, and for a sufficient length of time.

W I T H A M,

W I T H A M,

In Essex,

This is a chalybeate water of considerable strength, and is also impregnated with sea salt, but it will not bear carriage, and must be drank at the fountain.

It is very diuretic, and has been successfully prescribed in hectic fevers, in weakness occasioned by long disease, in lowness of spirits, nervous complaints, want of appetite, indigestion, habitual cholic, and vomiting; in agues, in the jaundice, and beginning dropfy; in the gravel, and in asthmatic and scorbutic disorders.

W I R K S W O R T H,

In Derbyshire.

It is a weak sulphureous water, impregnated with a purging salt, and is also chalybeate.

It is recommended in scrophulous, and cutaneous disorders.

ZAHOROVICE,

In Germany.

The spring is near to this village, in the district of the Castle of Suietlovia, in a rocky valley, by the side of the river Nezdenice.

It is an acidulous water, salter, but less acid than that of *Nezdenice*; and it is also somewhat pungent and foetid.

It is in great esteem in the neighbourhood, particularly for the cure of scrophulous disorders.

C O N-

C O N C L U S I O N.

FOR the sake of brevity, I have omitted a particular description of each water in the preceding account, and occasionally referred the reader to some water of the same kind which has been more fully treated of ; and the general virtues of the different classes of waters are also described at large in the Introduction.

In the Appendix to Dr. Priestley's tract, I have given directions for imitating some of those waters. The acidulous waters of the 5th class, for example, may be imitated, and even excelled, by simply impregnating water with *Fixed Air*. The solid ingredients are known to be of little or no consequence. If, however, these are desired, they may be added in the proportions directed under the article *Seltzer water* ; though it is by no means necessary that those proportions should be strictly adhered to.

A Purging water, answering perhaps all the intentions of those of the 6th class, may be made as directed for the *Seidscutz water*.

Rochelle

Rochelle or Glauber's salt may be substituted for the Epsom, if the latter be too nauseous ; and a little common salt may also be added. If the water to be imitated be a salt water, like that of the sea, the common salt should be in the greater proportion.

The chalybeate waters of the 1st class may be elegantly substituted, by water impregnated with Fixed Air, in which iron-filings, or wire, has been infused : or they may be made as directed under the articles *Spaw* and *Pymont water*. The chalybeate purging waters of the 2d class may be imitated by adding to a gallon of this water two or three ounces of Epsom, or other purging salt, and, if you will, a little sea salt.

For the sulphureous waters of the 3d class water impregnated with sulphureous air may be advantageously used : or they may be made as directed under the article *Aix-la-Chapelle water*. If they are also required to be chalybeate, or purging, or both, iron-filings, or Epsom salt, or both these may be added, together with a little sea salt, according to circumstances. For cold sulphureous waters both fixed and sulphureous airs are to be employed ; as mentioned in the Appendix ;
and

and even for the hot sulphureous waters it may be proper to put a small proportion of chalk with the liver of sulphur into the lower vessel A of the apparatus.

They who have a knowledge of natural philosophy, will perceive that these artificial waters are not only equal, but even superior to the natural ones, especially when they cannot be drank at the spring head. Their virtues, for the most part, depend on their *volatile* principles, and art can make water imbibe more than double the quantity of fixed, or sulphureous air, that the strongest natural waters are ever found to contain. The latter are also frequently impregnated with hurtful or, at least, useless ingredients; and we cannot always be sure that we have them genuine. It is not, however, by any means, the Author's wish to proscribe the use of the natural waters. Many of them have particular virtues, as has been proved by undoubted experiments: and there are others which art cannot yet sufficiently imitate.

Many people again, through prejudice, will not use the artificial waters, as they do not believe it possible that they can be made sufficiently to resemble the natural ones; but
even

even those will not object to the use of water impregnated with *fixed* or *sulphureous air* in a *medicinal* view.

Water impregnated with fixed air is now known to be a very powerful antiseptic, or corrector of putrifaction. It will preserve flesh kept in it sweet, and even restore it after it becomes putrid. It is therefore given with great success in putrid fevers, in the sea scurvy, in dysenteries, in mortifications, and in other disorders arising from a putrid cause, or attended with putrifaction, a draught of it being taken now-and-then, or even by way of common drink. But the ingenious Mr. Bewly has invented a still better method of exhibiting fixed air, as a medicine: he directs a scruple of alkaline salt to be dissolved in a sufficient quantity (suppose a quarter of a pint, or less) of water, which is to be impregnated with as much fixed air as it can imbibe; this is to be drank for one dose. ‡ If immediately after it a spoonful of lemon juice, mixed with two or three spoonfuls of water, and sweetened with sugar, be drank, the fixed air will be extricated in the stomach; and by this means a
much

‡ Mr. Bewly directs it to be prepared in larger quantity at a time, (as indeed it ought, in order to save trouble) and calls it his *Mephitic Julep*.

much greater quantity of it may be given than the same quantity of water alone can be made to imbibe. In this way I have given it in the above disorders, as well as in those that follow, with the best effect.

Fixed air acts as a corroborant; and therefore may be given with success in weakness of the stomach, and in vomitings arising from that cause.

It has already been noticed, in the Introduction, that if mild calcareous earth be superaturated with fixed air, it becomes soluble in water. The calculus, or stone in the bladder, consists partly of this earth. Fixed air therefore has been given as a *solvent* in this case with success.

When the lungs are purulent, fixed air mixed with the air drawn into the lungs, has repeatedly been found to perform a cure.

The bark may be given with advantage in water impregnated with fixed air, as they both coincide in the same intention.

Fixed air may be applied by means of a syringe, or otherwise, to putrid ulcers, mortified parts, ulcerated sore throats, and in similar cases, and it has been found to have remarkable efficacy. It may also be given internally at the same time.

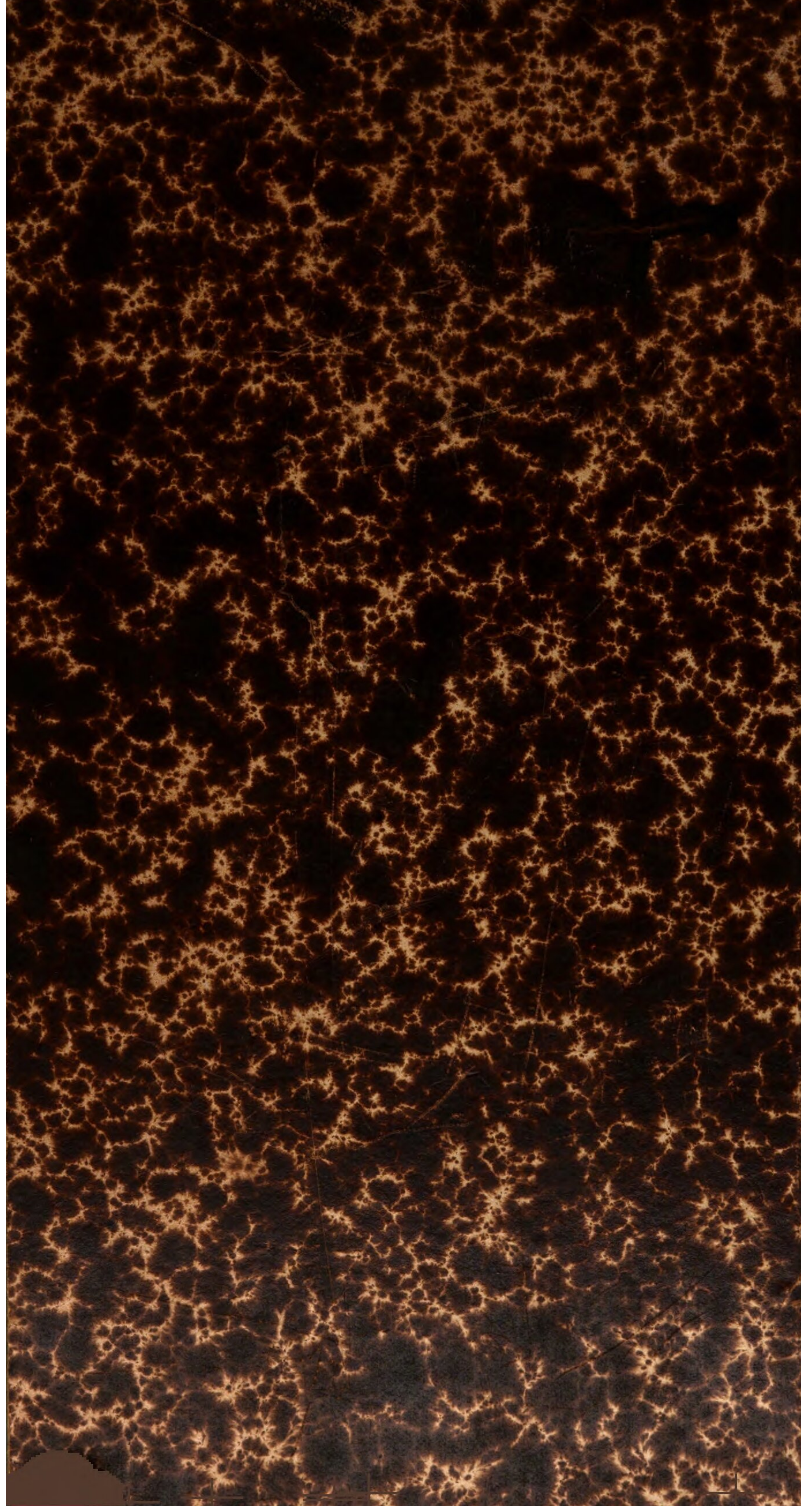
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In putrid dysenteries, and in putrid stools, fixed air may be given by way of clyster, as hath been observed by the learned and ingenious Dr. Priestley (whom I have the honour to call my friend) in the former part of this work. Fermenting cataplasms are of service chiefly as they supply fixed air to the part.

In cases of putridity, fixed air has been successfully applied to the surface of the body, exposed to streams of it. And there are other cases in which it has been found serviceable. It is also an excellent cooling as well as strengthening beverage in hot relaxing weather, and it has besides the advantage of being pleasant tasted.

The virtues of water impregnated with *sulphureous air* may be collected from what was said in the Introduction, concerning sulphureous waters.

F I N I S.



Elliot, John

An account of the nature and medicinal virtues of the principal mineral
waters of Great Britain and Ireland ...

London 1781

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